Richard Lester Deposition Excerpts

IN THE UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF OHIO

EASTERN DIVISION

KELCI STRINGER, Individually,)
as Representative of the)
Estate of Korey Stringer,)
Plaintiff,)
vs.) No. C2 03 665
NATIONAL FOOTBALL LEAGUE,)
et al.,)
Defendants.)

The deposition of RICHARD A. LESTER, Vice President, General Counsel, called by the Plaintiff for examination, taken pursuant to the Federal Rules of Civil Procedure of the United States District Courts pertaining to the taking of depositions, taken before JOANNE H. RICHTER, a Notary Public within and for the County of Cook, State of Illinois, and a Certified Shorthand Reporter of said state, No. 84-2082, at Westin O'Hare, 6100 North River Road, Rosemont, Illinois, on the 17th day of October, A.D. 2008, at 9:00.

MR. TUCKER: Objection.
BY MR. DeMARCO:
Q. And still be considered consistent with the NOCSAE standard?
MR. TUCKER: Objection. You are asking for an opinion of counsel on that. I an am instructing him not to answer. You are asking for a legal opinion from him.
MR. DeMARCO: Can you read the question, please.
(WHEREUPON, the record was read by reporter as requested.)
MR. TUCKER: I object that you are asking for a legal opinion.
BY MR. DeMARCO:
Q. Is Riddell a company that purports to follow the NOCSAE standard, Mr. Lester?
A. Yes.
Q. And I think I heard you say that there is no NOCSAE position stating that only the NOCSAE prescribed warnings should appear on helmets, correct?
MR. TUCKER: That's not what he said. He said he didn't know of NOCSAE taking a position on that.

MR. DeMARCO: That's what I said, no position.
BY MR. DeMARCO:
Q. NOCSAE has never taken a position on that, correct?
MR. TUCKER: You said he didn't know of NOCSAE --
BY THE WITNESS:
A. I said I wasn't aware of any position they have taken. There are pretty extensive labeling requirements in the standard that I don't know verbatim, but I am not aware of any.
BY MR. DeMARCO:
Q. Do you have any reason to say that a company would violate the NOCSAE standards by putting on its helmet a warning other than the NOCSAE prescribed warning?
MR. TUCKER: Objection, instruct him not to answer. You are asking him to give a legal opinion.
MR. DeMARCO: He has been a NOCSAE board member. I am asking him as a former NOCSAE board member.
MR. TUCKER: No, you are asking him as a lawyer whether it is compliant with NOCSAE

standards, and he is not going to give you a legal opinion.
You are infringing on work product and attorney-client privilege as general counsel of Riddell. You can't do that. It's an improper question.
MR. DeMARCO: That has absolutely nothing to do with work product and you know it, Bob. It has nothing to do with attorney-client privilege.
MR. TUCKER: Sure, it does. You cannot ask him for his legal opinion.
MR. DeMARCO: He has been a member of the NOCSAE board, and he has --
BY MR. DeMARCO:
Q. You have been involved in NOCSAE affairs since 1979, have you not, Mr. Lester?
A. I have not. I was actively involved through the time that I was on the board of directors. I have not attended NOCSAE meetings for probably 15 years.
Q. How many NOCSAE meetings did you attend?
A. They were held twice a year, through -- from '79 through early '90s. So 25 to 30 NOCSAE meetings through those years.

Q. In all of your experience, then, with NOCSAE, have you ever seen NOCSAE take a position that a manufacturer could not remain compliant with NOCSAE standards if it included other warnings on its helmet?
MR. TUCKER: You may answer the question if you know if NOCSAE has taken that position. If you know.
BY THE WITNESS:
A. I don't know. I am not aware of any such position taken by NOCSAE.
BY MR. DeMARCO:
Q. And it is part of your responsibility to ensure that Riddell is compliant with NOCSAE standards, correct?
MR. TUCKER: You may answer that.
BY THE WITNESS:
A. I participate in that, yes. It is a function of design and engineering, as well as what I do.
BY MR. DeMARCO:
Q. Would Riddell still be compliant with NOCSAE standards if it included on its helmets warnings other than the NOCSAE prescribed warnings?

MR. TUCKER: Objection. You are asking for a legal opinion. I am instructing him not to answer.
MR. DeMARCO: I need that to be marked. We are going to have to talk to the magistrate judge.
MR. TUCKER: So to state my position, you are asking the general counsel to render an opinion as to whether the company is or is not compliant. That's a legal opinion.
MR. DeMARCO: So that I state my position, it is part of his responsibilities for compliance with NOCSAE standards. I didn't make up his responsibilities. Riddell did.
MR. TUCKER: I have no idea what --
BY MR. BAYLESS:
Q. You understand, Mr. Lester, this may result in us having to take your deposition again?
MR. TUCKER: Whether he understands it or not is not your concern. It is my concern, and I understand it.
MR. DeMARCO: I need to make Mr. Lester understand.
BY MR. DeMARCO:
Q. You do understand that this may result in me having to take your deposition again?

MR. TUCKER: Improper question. You don't have to answer that.
MR. DeMARCO: All right. Let's take a break.
(WHEREUPON, a recess was had.)
(WHEREUPON, a document was marked Deposition Exhibit No. 2, for identification, as of 10/17/08.)
BY MR. DeMARCO:
Q. Mr. Lester, I am handing you what has been marked as Exhibit 2. Would you describe that for me, please.
A. It is entitled "Summary 1984 Report." It is a report that summarizes the known football injuries sustained by players for the 1984 football season.
Q. Who produced the report?
A. There is no indication on the report. Here it is, okay, on the second page, "Frederick O. Mueller, Ph.D., and Richard D. Schindler."
Dr. Mueller is at the University of North Carolina, and Mr. Schindler is with the National Federation of State High School Associations.

Q. The documents that you produced responsive to Document Request No. 3, any documents related to heat illness, all of these came from your file, correct, not your litigation file, but your personal file?
A. Yes.
Q. They were in your possession?
A. Yes.
Q. How did you come into possession of this document that we have marked as Exhibit 2?
A. Probably in -- as we go through these, there will be different ways that I came into possession of them, but this is a study that's been done since 1931 and is well known in the football community.
My reason for coming into possession was that I wanted to track -- I knew that Dr. Mueller tracks head and neck injuries in football on an annual basis, and I wanted to track those myself, as a part of my job at Riddell.
So I don't know if I obtained this one through a request to him or, perhaps, through a request to the National Federation of State High School Associations, or whether I was just on a

mailing list that received this.
Q. Did you have a standing request into Dr. Mueller or his organization for copies of this survey?
A. I don't believe I did, no.
Q. Did you read the entire report?
A. I probably did at one time.
Q. Do you have any reason to think that you didn't receive Exhibit 2 when it was produced by Dr. Mueller and his organization, whether it was 1984, or, it appears they lag a year, maybe 1985?
A. A year or more. I have no reason to believe that I didn't receive it.
Q. At that time?
A. Sometime within 18 months of the 1984 season.
(WHEREUPON, a document was marked Deposition Exhibit No. 3, for identification, as of 10/17/08.)
BY MR. DeMARCO:
Q. I hand you what's been marked as Exhibit 3 and ask you to identify that.
A. This is entitled "The Annual Survey of Football Injury Research, 1931 to 1985." Again,

A. No.
Q. You are not qualified to diagnose or treat heat illness?
A. I am not.
Q. You are not qualified to explain the causes of heat illness, are you?
A. No.
Q. You have not done any studies on the relationship between football equipment and heat illness, have you?
A. I not done any studies myself, no.
Q. Have you commissioned any studies?
A. I have not.
Q. Have you been involved in any studies in the relationship between football equipment and heat illness?
A. I have not.
Q. Did Riddell design the AF-2 helmet with thermoregulation in mind?
MR. TUCKER: Objection, form. Go ahead.
BY THE WITNESS:
A. That really would be a question for the engineering department, design people, Thad Ide. I wasn't involved in the design of the AF-2.

BY MR. DeMARCO:
Q. Did you or anyone else at Riddell ever discuss putting on any Riddell helmets a warning about heat-related illness?
MR. TUCKER: Objection, that's calling for the general counsel of the company to express opinions on legal advice that may or may not have been given to the company. It is an improper question. I am instructing the witness not to answer.
BY MR. DeMARCO:
Q. Has Riddell ever considered putting any of -- strike that.
Has Riddell ever considered putting on its helmets any warning about heat-related illness?
MR. TUCKER: Again, posing that question to the general counsel of Riddell infringes upon his attorney-client relationship. Whether they did or they didn't is an impermissible question. He is instructed not to answer.
MR. DeMARCO: Mark that, as well, please.
BY MR. DeMARCO:
Q. Mr. Lester, will you tell me everything you know about heat-related illness.
MR. TUCKER: I will object to the form, but go ahead.
BY THE WITNESS:
A. What I know about heat-related illness?
BY MR. DeMARCO:
Q. Yes.
A. I know that it is a concern for anyone engaged in exertional activities on hot and humid days, and that there are a number of factors that must be considered if you are going to concern yourself with the risk of heat illness.
Among them, the environment you are in, meaning temperature and humidity, the activity you are engaged in, if it is exertional, whether it be -- well, any kind of sport, any kind of physical activity, involving climbing, hiking, depend -- the clothing you are wearing has an effect on your risk, as well as the condition of the person that you are talking about, whether they are in good physical condition, if they are used to being in the heat and exerting themselves in the heat. So, I guess that would be my summary of what I know about it.
Q. Okay. Is that all information you had as of July 31, 2001, as best you can recall?

MR. TUCKER: Objection, go ahead.
BY THE WITNESS:
A. I think it's information that I have known since I was playing baseball as a little boy.
BY MR. DeMARCO:
Q. Where did the wording on -- the current wording on Riddell helmet warnings, where did it come from? Is it all the NOCSAE-prescribed warning text?
A. It started with the NOCSAE-prescribed warning text. That wording has been changed through the years, with the same message being given up until about 2002.
And in 2002, our engineering and design department were engaged in the process of designing the Revolution helmet, which was a helmet designed with the intent to reduce concussions.
At about the same time as we were -- the company was designing that helmet, there was a good deal of research going on by the neurosurgeons and neurologists identifying a new type of injury, at least relatively new for the 2000 period, and that was an injury that was identified in adolescent children who sustained a relatively minor head

illness, right?
MR. TUCKER: Objection, form.
BY MR. DeMARCO:
Q. Or the concern for or the risk of heat illness, nothing in there relates to that?
MR. TUCKER: Objection, form. Go ahead and answer.
BY THE WITNESS:
A. Well, I think I will stick with my answer, nothing in here refers to the issue of heat illness, period, whether it be -- however you want to characterize it. There is nothing in here regarding heat illness.
BY MR. DeMARCO:
Q. And none of those warnings, then, are intended to prevent heat illness?
MR. TUCKER: Objection, form.
BY THE WITNESS:
A. None of the warnings are intended to prevent heat illness, correct.
MR. DeMARCO: Quick break.
(WHEREUPON, a recess was had.)
BY MR. DeMARCO:
Q. Apart from this litigation, have you had

opportunities to review any studies related to heat illness?
A. I haven't reviewed studies related to heat illness beyond the limited discussion of them in the Schindler reports.
Q. Okay. And apart from this lawsuit, have you had any personal experience with heat-related illness?
MR. TUCKER: Objection. Go ahead.
BY THE WITNESS:
A. If the question is whether I have ever experienced a heat-related illness, I have not.
BY MR. DeMARCO:
Q. You have never observed someone experiencing a heat-related illness?
A. Actually, I have, when I was very small, friend of my father's, but that was many, many, many years ago.
Q. Do you know what the nature of it was?
A. I don't.
Q. Have you reviewed any data regarding heat-related injuries in the National Football League?
A. I have never seen that, no.

Q. When Riddell places a warning on its helmet or on a tag attached to its helmet, it anticipates that the player will follow the warning, correct?
MR. TUCKER: Objection to the form of the question. You are asking for a legal -- I think you are asking for a legal opinion from the general counsel of Riddell, so --
BY MR. DeMARCO:
Q. When, in the period before 2000 that we talked about where the warnings were, we think, fixed from and after 1999, on Exhibit 19, did Riddell anticipate that these warnings would be followed by the players wearing the AF-2s?
MR. TUCKER: Objection to the form and the using the word "fixed." I am not quite sure what you mean by that.
BY MR. DeMARCO:
Q. I think we talked before about, you know of no changes to the warnings that appear here after 1999, correct?
A. I don't know of any, correct, until 2002.
Q. So during the period when these warnings

were in use on the AF-2, those warnings that appear on Exhibit 19, did Riddell anticipate that the players wearing these helmets would follow the warnings?
A. Yes, I don't know that I would use the word "anticipate." Our intent was to put the warning on the helmet and our hope was that the player would read the warning and comply with the warning.
I don't know that I would go so far as to say I anticipated that everyone would, but that was our intent.
Q. What has Riddell done to reduce the incidence of heat illness among NFL players, if anything?
MR. TUCKER: Objection, go ahead.
MR. BLOCK: I didn't catch the question.
(WHEREUPON, the record was read by reporter as requested.)
MR. BLOCK: Object to the form
MR. TUCKER: I object to it, as well. Go ahead.
BY THE WITNESS:
A. Well, I think that's really within the

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scope of the coaches and trainers and people controlling practice and play at the level of the NFL rather than something that Riddell would be involved in.
BY MR. DeMARCO:
Q. So is the answer "nothing"?
MR. TUCKER: Objection to the form.
BY THE WITNESS:
A. I will stick with my answer.
BY MR. DeMARCO:
Q. Has Riddell done anything to reduce the incidence of heat illness among NFL players?
MR. TUCKER: Objection. Go ahead.
BY THE WITNESS:
A. As I said before, no, I think that's more in the province of the coach and the trainers onsite.
BY MR. DeMARCO:
Q. I didn't hear you say "no" before. I am sorry. Has Riddell done anything to determine the magnitude of the heat illness problem among NFL players?
MR. TUCKER: Objection.
MR. BLOCK: Objection to the form.

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MR. TUCKER: Objection to the form of the question. You can go ahead and answer.
BY THE WITNESS:
A. Not that I am aware of.
BY MR. DeMARCO:
Q. Has Riddell done anything to determine the magnitude of the heat illness problem among football players, in general?
MR. TUCKER: Objection to form.
MR. BLOCK: Join.
BY THE WITNESS:
A. Not that I am aware of, no.
BY MR. DeMARCO:
Q. Does Riddell take the position that there is not a heat illness problem among NFL players?
MR. TUCKER: Objection to the form. It's close to asking for an opinion of the general counsel, but I will let him answer that question.
BY MR. DeMARCO:
Q. Among NFL players or football players, in general?
A. I think it is our opinion that there are so many factors involved in the issue of potential

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heat illness, it goes way beyond the Riddell helmet and shoulder pads. It goes to the condition of the player. It goes to the environment they are in. It goes to not only helmet and shoulder pads, but long pants, jerseys, knee pads, thigh pads, neoprene sleeves, gloves, the condition of the player, what type of condition they are in as far as weight is concerned, whether they are used to hot temperatures.
So, no, I don't think that we are alleging or claiming that there is not a problem, but it is a problem that has many, many factors that control it.
Q. Of the equipment that you just mentioned, what does Riddell make? You just listed some equipment.
A. We make helmets, shoulder pads. We sell other types of body padding, knee pads, thigh pads, elbow pads. We make custom uniforms.
I think we sell gloves. We don't make them.
Q. Has Riddell made any assessment of the extent to which the products you just listed contribute to heat illness among football players?

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MR. TUCKER: Objection, form. Go ahead.
BY THE WITNESS:
A. Was the question whether we have done any studies?
BY MR. DeMARCO:
Q. Made any assessment.
A. We have not.
Q. Do you intend to do so in the future?
MR. TUCKER: Objection, that's a question that's asked of the general counsel of Riddell, and I instruct him not to answer that question. It is an impermissible question and infringes upon his attorney-client relationship.
BY MR. DeMARCO:
Q. Does Riddell intend to do so in the future, sir?
MR. TUCKER: I instruct him not to answer. It is an impermissible question.
MR. DeMARCO: Would you mark that, please.
BY MR. DeMARCO:
Q. As of July 31, 2001, Riddell knew, did it not, that its helmets and shoulder pads were being worn during practices at NFL training camps?
A. We knew that, yes.

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I told you that I know that, in August and July around the country, they will be practicing on hot and humid days.
BY MR. DeMARCO:
Q. And you knew that Riddell knew that its helmets were being worn on such days at NFL training camps --
A. Yes.
Q. -- as of July 31, 2001, correct?
A. Correct.
Q. As of July 31, 2001, had Riddell made any assessment of the seriousness of the heat illness that could result from wearing its helmets and shoulder pads in hot and humid conditions?
MR. TUCKER: Objection, form. I will let you go ahead and answer the question.
BY THE WITNESS:
A. I am not going to answer the question because I don't agree with the way it was stated.
BY MR. DeMARCO:
Q. You may not agree with the premise, but it is a legitimate question.
Had they made an assessment?
A. I am not going to answer yes or no when

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you attribute the heat illness to the helmet and shoulder pads. I don't agree with that.
Q. So Riddell had not made such an assessment?
MR. TUCKER: Objection to the form.
BY MR. DeMARCO:
Q. Because you don't agree that there is such a risk?
MR. TUCKER: Objection to the form of the question. You are asking for an opinion of the general counsel. And so, he has answered your question. You can't ask him for his opinion.
MR. DeMARCO: I am asking as of July 31, 2001. There is nothing about his opinion or -- it is Riddell's assessment at that time. There is nothing about his opinion.
BY MR. DeMARCO:
Q. Had Riddell made the assessment of the seriousness of heat-related illness that could result from wearing Riddell helmets and shoulder pads in extremely hot and humid conditions? Had they made that assessment?
A. My answer is I don't agree with your opinion and your allegation that heat illness

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results from wearing helmets and shoulder pads.
Q. And as a result of holding that opinion, and I suppose Riddell, as a whole, holds that opinion, Riddell did not make the assessment -- had not made the assessment as of July 31, 2001, correct?
A. I will stick with my answer.
Q. And even today, Riddell has not made that assessment?
A. I will stick with my answer.
MR. DeMARCO: Would you mark that, please, both of those.
BY MR. DeMARCO:
Q. As of July 31, 2001, had Riddell evaluated the cost of taking effective precautions to avoid having players develop heat illness?
MR. TUCKER: Objection to the form of the question. You may answer.
BY THE WITNESS:
A. I am not sure I understand what you mean. Once again, the way to avoid heat illness is to understand what causes it. And that's really a matter for the coaches and the training staff who understand the conditions under which they are

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practicing. They understand the condition the player is in. They control who is where and who wears what. So I don't know what you mean by "cost."
It is something that wouldn't be -- we couldn't pay to have the problem go away. It is in the province of the people running the practices and understanding the capabilities of their players or the environment that they are in to avoid the problem.
BY MR. DeMARCO:
Q. As of July 31, 2001, had Riddell evaluated the ease with which Riddell could take effective precautions to avoid having players develop heat illness?
MR. TUCKER: Objection, form.
BY THE WITNESS:
A. I would really give the same answer. It is not within Riddell's control to do away with the problem of heat illness. It is the responsibility of the teams, the coaches, the trainers and the players themselves.
Q. So are you saying Riddell plays no role in the prevention of heat illness?

A. We design and place warnings on a product to advise the wearer of certain things, for instance, that the fact that he has a helmet on his head will not prevent him from sustaining all head and neck injuries. That's not an attempt by us, or we certainly can't attempt to control a player's activity, but we can notify them of things we think it is important for them to know. So we advise them that if they butt, ram or spear an opposing player, the helmet is not going to prevent them from breaking their neck.

BY MR. DeMARCO:

Q. You advise them of all the risks of wearing the helmet that you think they need to know?

A. All the risks to their head and neck, which is the purpose of the helmet, is to protect the head, and so anything that we think they need to know about the limitations of the helmet to protect their head, we feel it is necessary to notify them of, so that's what we do.

Q. Is there any reason why you limit the warnings to head and neck warnings?

MR. TUCKER: Objection, form. Go ahead.

BY THE WITNESS:

A. Well, because that's what the helmet is designed to do, protect the head. And in some cases, players use their head in inappropriate ways because they have the helmet on their head, and that results in neck injuries, so we address those two areas of potential injury with the player.

BY MR. DeMARCO:

Q. Okay. And given that you don't apprise players of any other risks of wearing your helmet, Riddell's helmet, is it reasonable for the player who wears a Riddell helmet to assume that there are no other risks of injury as a result of wearing the helmet?

MR. TUCKER: Objection to the form. You can answer.

BY THE WITNESS:

A. I don't understand. You have to restate that, please.

(WHEREUPON, the record was read by reporter as requested.)

MR. TUCKER: Object.

BY MR. DeMARCO:

Q. Other than what you apprise the player of, is it reasonable for the player to assume there aren't any other risks other than those that you have apprised him of?

A. No, I don't think it is reasonable for a player to assume that.

When something -- if, once again, you are trying to refer to heat illness as a risk of injury, that's something that is so open and obvious to everyone who participates, not only in football, but in any exertional sport in hot, humid weather.

I think it would be totally unreasonable to assume that you can't be injured in any way or suffer other types of injuries when you are out playing football and practicing in a mini camp with or without equipment and clothes on.

Q. An NFL player wearing a Riddell helmet should understand that he can develop heat stroke as a result of wearing the Riddell helmet?

MR. TUCKER: Objection.

BY THE WITNESS:

A. Absolutely not.

BY MR. DeMARCO:

Q. What are you telling me?

A. I am telling you an NFL player, whether he has a helmet and shoulder pads on or not, should recognize the fact that he can suffer heat illness if all the factors that control heat illness are there: If it is hot and humid, if he is in poor physical shape, if he is sick with other illnesses, if he is not taking enough water, not hydrating, not acclimating himself to the climate, not -- I mean, there are just so many things involved, it has absolutely nothing to do with reasonable, unreasonable.

Anybody out in that situation, whether it is on a football field, a baseball field, track and field, shouldn't assume that under no circumstances are they going to suffer some kind of heat illness.

Q. Is an unacclimatized football player at increased risk of heat illness if he puts a Riddell helmet on?

MR. TUCKER: Objection to the form.

BY MR. DeMARCO:

Q. And practices?

A. I am not a doctor, so I am not going to say that that alone would increase the risk.

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Stringer, without having them develop heat stroke? If not you, who would know that?
MR. TUCKER: Objection to the form of the question. I think that's an unknowable question, but if you can --
BY THE WITNESS:
A. I don't know. I mean, you people have already deposed our designers and engineers, and they have gone into what the purpose of -- what the company's intention is with regard to the purpose of our equipment, and so that's where the question would be to, I suppose, to Thad Ide.
But I don't know that he has a position with respect to your question on heat illness and what the company's intention would be. I can't speak for him, however.
BY MR. DeMARCO:
Q. Is it fair to say that, to your knowledge, Riddell hadn't formed any opinion because heat illness wasn't on its radar screen as of July 31, 2001?
MR. TUCKER: Objection to the form of the question. You can go ahead and answer it, but I object to the form of the question, he hadn't

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formed any position because it wasn't on the radar screen.
BY THE WITNESS:
A. I am not sure what you mean by "wasn't on the radar screen."
I can tell you in the 30 years I have with Riddell, this case is the only time someone has alleged that helmets and shoulder pads are involved in any way in heat illness, so it was not an issue that we had faced prior to July 31, 2001.
BY MR. DeMARCO:
Q. But you acknowledged to me before, did you not, that a player putting on a helmet should not assume that he is free from the risk of developing heat stroke?
A. I don't believe I agreed with that statement. I think what I said is any athlete, regardless of the equipment he has on, should not assume that he cannot suffer from heat illness.
Q. So a football player wearing a football helmet made by Riddell should not assume that he can't suffer heat stroke?
A. I would agree with that, yes.

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Q. So was it Riddell's intention that players putting on Riddell helmet and shoulder pads as of July 31, 2001, could wear them without suffering heat stroke?
MR. TUCKER: It is the same question you have asked and he said he couldn't answer. But go ahead.
BY THE WITNESS:
A. No, I can't. I mean, that doesn't follow from your last question.
BY MR. DeMARCO:
Q. My questions don't have to follow from one another.
A. It is when you have prefaced your question by, the next one, with "so then you are assuming." You prefaced that with the response from the prior question, and there is no relationship to the two questions.
Q. Okay. Was it Riddell's intention that Korey Stringer could put on a Riddell helmet without developing heat stroke?
A. And I think I have already indicated to you I don't know that there was an intention either way from the company on that. It was not an issue

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with the company.
If someone asks me, as a representative of Riddell, I would say that no player in any sport should feel that they can go out and practice in hot, humid weather, with clothing on, and not take breaks, not hydrate, not acclimate, and presume that they are not going to have some potential for heat illness.
Q. Okay. And what exactly, then, is Riddell's reason, given what you just said -- so this question falls from the last one -- given what you just said, what exactly is Riddell's reason for not including a warning on the AF-2 about the risk of heat illness?
MR. TUCKER: I object to the question. You are asking for an opinion of the general counsel of Riddell, and I am instructing him not to answer the question.
BY MR. DeMARCO:
Q. I am asking in the period of time when you made the AF-2, which was before this lawsuit, what was Riddell's reason, given the risk that you just enunciated, what was Riddell's reason for not including a warning with respect to heat illness?

MR. TUCKER: Again, objection, and I am instructing him not to answer. You are asking for an opinion of the general counsel as to how he has advised the company, and that's an impermissible question.

MR. DeMARCO: I am asking as matter of historical fact. Would you mark that question, please.

BY MR. DeMARCO:

Q. Have you had any discussions with NFL representatives about heat-related illness?

A. No.

Q. Have you had any discussions with NOCSAE representatives about heat-related illness?

A. No.

Q. Have you had any discussions with anyone at Southern Impact regarding heat-related illness?

A. No.

Q. You mentioned earlier part of your responsibility are contracts.

Does that include the contract between the NFL and Riddell under which the NFL licenses helmets?

A. It does not.

MR. BLOCK: Sorry, I object to the form of that question.

BY MR. DeMARCO:

Q. Are you familiar with that agreement?

A. I am.

Q. It is not an agreement over which you have responsibility?

A. Well, it is not an agreement that I was involved in the formation of. I occasionally get questions about provisions in the agreement, but it is, no, not my responsibility to oversee that agreement.

Q. Okay. Are you familiar with Riddell's safety obligations under the agreement?

A. Not in detail, no. That would be Thad Ide that would know about the safety obligations.

Q. Who would be responsible for ensuring compliance with the safety obligations in the licensing agreement between the NFL and Riddell? I am talking about on the Riddell side.

A. That would be Thad Ide.

Q. Does the NFL have the authority, under the licensing agreement, to dictate that Riddell put notices on its helmets regarding heat illness?

MR. BLOCK: I object to the form.

MR. TUCKER: Objection to the form. If you know.

BY THE WITNESS:

A. I don't know.

BY MR. DeMARCO:

Q. Has the NFL ever attempted to instruct Riddell to put notices on its helmets regarding heat illness?

MR. TUCKER: Objection. Go ahead.

BY THE WITNESS:

A. I am not aware of anything like that, no.

BY MR. DeMARCO:

Q. This is a variation of a question I already asked. But we can agree, can we not, that the Riddell NFL helmet was intended to be worn by NFL players during training camp?

MR. TUCKER: Objection, asked and answered. Go ahead and answer it again.

BY THE WITNESS:

A. I am not sure I know what you mean by "the Riddell NFL helmet."

The Riddell helmet is the Riddell helmet

for varsity players, whether it be high school college, or the NFL. Riddell helmets are intended to be worn by NFL players.

Q. Yes, I think it is a defined term in your agreement with the NFL.

MR. BLOCK: Objection to the extent you are asking him about the agreement that he says he doesn't know about. Objection to the extent you are trying to use the term from the agreement.

MR. DeMARCO: It is not that he doesn't know anything about it.

BY MR. DeMARCO:

Q. Can we agree that players who are involved in training camps are engaging in activities connected to the sport of football?

MR. TUCKER: Go ahead. You can answer.

BY THE WITNESS:

A. I think I have already answered that I am -- I have never attended a training camp, so I don't know specifically what they do, other than train to play football, so I would say that they are there training, getting ready for football season.

BY MR. DeMARCO:

Richard Lester Deposition Exhibits 5, 6, 7, 8, 10

Annual Survey of Football Injury Research 1931-1990

Frederick O. Mueller, Ph.D.
Chairman, American Football Coaches Committee on Football Injuries
and
Richard D. Schindler
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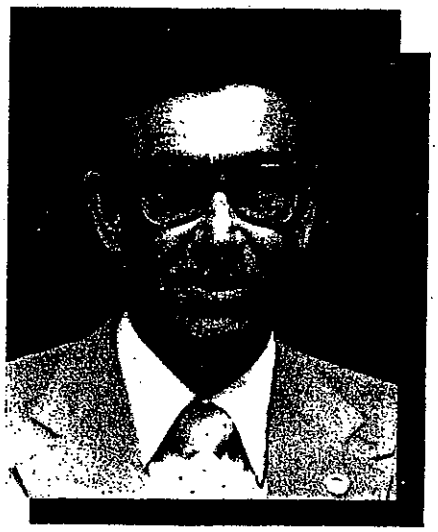
Prepared for:
American Football Coaches Association
Orlando, Florida;
National Collegiate Athletic Association
Overland Park, Kansas;
The National Federation of State High School Associations
Kansas City, Missouri

Submitted February, 1991

Section I
INTRODUCTION

In 1931 the American Football Coaches Association initiated the First Annual Survey of Football Fatalities. The original survey committee was chaired by Marvin A. Stevens, M.D., of Yale University, who served from 1931-1942. Floyd R. Eastwood, Ph.D., Purdue University, succeeded Dr. Stevens in 1942 and served through 1964. Carl S. Blyth, Ph.D., University of North Carolina at Chapel Hill, was appointed in 1965 and served through the 1979 football season. In January 1980, Frederick O. Mueller, Ph.D., University of North Carolina at Chapel Hill, was appointed by the American Football Coaches Association and the National Collegiate Athletic Association to continue this research under the new title, Annual Survey of Football Injury Research.

The primary purpose of the Annual Survey of Football Injury Research is to make the game of football a safer and, therefore, a more enjoyable sports activity. Because of these surveys, the game of football has realized many benefits in regard to rule changes, improvement of equipment, and improved coaching techniques. The 1976 rule change that made it illegal to make initial contact with the head while blocking and tackling was the direct result of this research.



The 1990 report is historic in that it is the first year since the beginning of the research, 1931, that there has not been a direct fatality in football at any level of play. This clearly illustrates that this type of data collection and constant analysis of the data is important and plays a major role in injury prevention.

Data Collection

Throughout the year, upon notification of a suspected football fatality, immediate contact is made with the appropriate officials (coaches, administrators, physicians, trainers). Pertinent information is collected through questionnaires and personal contact.

Football fatalities are classified for this report as direct and indirect. The criteria used to classify football fatalities are as follows:

Direct — Those fatalities which resulted directly from participation in the fundamental skills of football.

Indirect — Those fatalities which are caused by systemic failure as a result of exertion while participating in football activity or by a complication which was secondary to a non-fatal injury.

In several instances of reported football fatalities, the respondent stated the fatality should not be attributed to football. Reasons for these statements are that the fatality was attributed to physical defects that were unrelated to football injuries.

Participation numbers were updated in the 1989 report. The National Federation of State High School Associations has estimated that there are approximately 1,500,000 high school, junior high school, and non-federation school football participants in the United States. The college figure of 75,000 participants includes the National Collegiate Athletic Association, the National Association of Intercollegiate Athletics, the National Junior College Athletic Association, and an estimate of schools not associated with any national organization. Sandlot and professional football have been estimated at 225,000 participants. These figures give an estimate of 1,800,000 total football participants in the United States for the 1991 football season.

Dr. Mueller compiled and prepared the survey report on college, professional and sandlot levels, and Mr. Richard D. Schindler of the National Federation of State High School Associations assumed complete responsibility for collecting and preparing the senior and junior high school phase of the study. Sandlot is defined as non-school football, but organized and using full protective equipment.

At the conclusion of the football season, both reports are compiled into this Annual Survey of Football Injury Research. This report is sponsored by the American Football Coaches Association, The National Collegiate Athletic Association, and The National Federation of State High School Associations.

Acknowledgements

This 1990 report was compiled with the assistance of executive officers, high

school and college coaches, athletic directors, school administrators, physicians, a national newspaper clipping agency, and professional associates of the authors.

Section II
SUMMARY

1. There were no fatalities directly related to football during the 1990 football season. This is the first time since the research began in 1931 that there has not been a direct football fatality in football. The elimination of direct football fatalities in 1990 can be directly related to the *Annual Survey of Football Injury Research 1931 - 1990*. (Table 1)

2. The incidence of direct fatal injuries is very low on a 100,000 player exposure basis. For the approximately 1,800,000 participants in 1990, the incidence of direct fatalities was 0.00 participants per 100,000 players.

3. The incidence of direct fatalities in high school and junior high school football was 0.00 participants per 100,000 players. The incidence of direct fatalities in college was 0.00 participants per 100,000 players. (Table III)

4. In many cases football cannot be directly responsible for fatal injuries (heat stroke, heart failure and so forth). In 1990 there were six indirect fatalities. Three were associated with high school football and three were associated with college football. Two of the high school indirect deaths were related to heart failure and one to an asthma attack. One of the college indirect fatalities was related to heart failure, one to heat illness and one to exertion induced rhabdomyolysis (destruction of skeletal muscle) with sickle cell trait being a possible contributing factor. (Table VIII)

Section III
Discussion and Recommendations

After a slight rise in the number of football fatalities during the 1986 season, the 1990 data reveal the elimination of direct football fatalities. This is the first time in the past 59 years that there have been no direct football fatalities. The 1990 data illustrate the importance of data collection and the analysis of this data in making changes in the game of football that help reduce the incidence of serious injuries. An all out effort must be made to keep these figures low and to strive for the continued elimination of football fatalities.

Head and Neck Injuries

Past efforts that were successful in reducing fatalities to the level indicated in the 1979, 1983, 1984, 1985, 1987, 1989 data and the elimination of direct fatalities in 1990 should again be emphasized. Rule changes for the 1976 football season which eliminated the head as a primary and initial contact area for blocking and tackling is of utmost importance. Since 1960 most of the direct fatalities have been caused by head and neck injuries. We must continue to reduce head and neck injuries.

Several suggestions for reducing head and neck injuries are as follows:

1. Athletes must be given proper conditioning exercises which will strengthen their necks so that participants will be able to hold their heads firmly erect when making contact.

2. Coaches should drill the athletes in the proper execution of the fundamental football skills, particularly blocking and tackling. Contact should always be made with the head up and never with the top of the head/helmet. Initial contact should never be made with the head/helmet.

3. Coaches and officials should discourage the players from using their heads as battering rams when blocking and tackling. The rules prohibiting spearing should be enforced in practice and in games. The players should be taught to respect the helmet as a protective device and that the helmet should not be used as a weapon.

4. All coaches, physicians, and trainers should take special care to see that the player's equipment is properly fitted, particularly the helmet.

5. When a player has experienced or shown signs of head trauma (loss of consciousness, visual disturbances, headache, inability to walk correctly, obvious disorientation, memory loss), he should receive immediate medical attention and should not be allowed to return to practice or game without permission from the proper medical authorities.

Another important effort has been and continues to be the improvement of football protective equipment. It is imperative that old and worn equipment be properly renovated or discarded and

TABLE I

Fatalities: Directly Due To Football - 1931 - 1990*

Year	SANDLOT Direct	PRO AND SEMIPRO Direct	HIGH SCHOOL Direct	COLLEGE Direct	TOTAL Direct
**1931-1959	115	68	262	41	486
1960	1	1	11	1	14
1961	3	0	10	6	19
1962	6	1	12	0	19
1963	1	1	12	2	16
1964	4	1	21	3	29
1965	4	0	20	1	25
1966	4	0	20	0	24
1967	5	0	16	3	24
1968	4	1	26	5	36
1969	3	1	18	1	23
1970	3	0	23	3	29
1971	2	0	15	3	20
1972	3	1	16	2	22
1973	2	0	7	0	9
1974	0	0	10	1	11
1975	1	0	13	1	15
1976	3	0	15	0	18
1977	1	0	8	1	10
1978	0	0	9	0	9
1979	0	0	3	1	4
1980	0	0	9	0	9
1981	2	0	5	2	9
1982	2	0	7	0	9
1983	0	0	4	0	4
1984	1	0	4	1	6
1985	2	0	4	1	7
1986	0	0	10	1	11
1987	0	0	4	0	4
***1988	0	0	7	0	7
1989	0	0	4	0	4
1990	0	0	0	0	0
TOTALS	172	75	605	80	932

* No study was made in 1942.
** Yearly totals available from past reports.
*** 1988 data changed due to updated information.

continued emphasis be placed on developing the best equipment possible. Manufacturers, coaches, trainers, and physicians should continue their joint and individual efforts toward this end.

The authors of this research are convinced that the current rules which eliminate the head in blocking and tackling, the helmet research conducted by NOCSAE, excellent physical conditioning and proper medical supervision have played the primary role in reducing fatalities and serious head and neck injuries in football.

This is best illustrated by Table IX and Graph I which show the increase in both head and cervical spine fatalities during the decade from 1965-1974. This time period was associated with blocking and tackling techniques that involved the head as the initial point of contact.

The reduction in head and cervical spine injuries is shown in the decade from 1975-1984. This decade was associated with the 1976 rule change that eliminated the head as the initial contact point in blocking and tackling. There is no doubt that the 1976 rule change has made a difference and that a continued effort should be made to keep the head out of the fundamental skills of football.

Heat Stroke

A continuous effort should be made to eliminate heat stroke deaths associated with football. Since the beginning of the survey through 1959 there were five cases of heat stroke death reported. From 1960 through 1990 there have been seventy-nine heat stroke cases which resulted in death (Table IV).

Since 1974 there has been a dramatic reduction in heat stroke deaths with the exception of 1978 when there were four. One death was caused by heat stroke in 1990. All coaches, trainers, and physicians should continue their efforts toward eliminating athletic fatalities which result from physical activity in hot weather.

Heat stroke and heat exhaustion are prevented by careful control of various factors in the conditioning program of the athlete. When football activity is carried on in hot weather, the following suggestions and precautions should be taken:

1. Each athlete should have a complete physical examination with medical history and an annual health history update. History of previous heat illness and type of training activities before organized practice begins should be included.

2. Acclimatize athletes to heat gradually by providing graduated practice sessions for the first seven to ten days and other abnormally hot or humid days.

3. Know both the temperature and the humidity since it is more difficult for the body to cool itself in high humidity. Use of a sling psychrometer is recommended to measure the relative humidity, and anytime the wet-bulb temperature is over 78 degrees practice should be altered.

4. Adjust activity level and provide frequent rest periods. Rest in cool, shaded areas with some air movement and remove helmets and loosen or remove jerseys. Rest periods of 15-30 minutes should be provided during workouts of one hour.

5. Provide adequate cold water replacement during practice. Water should always be available in unlimited quantities to the athletes. ***Give Water Regularly.***

6. Salt should be replaced daily and liberal salting of the athletes' food will accomplish this purpose. Coaches should not provide salt tablets to athletes. Attention must be directed to water replacement.

7. Athletes should weigh each day before and after practice and weight charts checked in order to treat the athlete who loses excessive weight each day. Generally, a three percent body weight loss through sweating is safe, and a five percent loss is in the danger zone.

8. Clothing is important and a player should avoid use of long sleeves, long stockings, and any excess clothing. Never use rubberized clothing or sweatsuits.

9. Some athletes are more susceptible to heat injury. These individuals are not accustomed to work in the heat, may be overweight, and may be the eager athlete who constantly competes at his capacity. Athletes with previous heat problems should be watched closely.

10. It is important to observe for signs of heat illness. Some trouble signs are nausea, incoherence, fatigue, weakness, vomiting, cramps, weak rapid pulse, flushed appearance, visual disturbances, and unsteadiness. If heat illness is suspected, seek a physician's immediate service. Recommended emergency procedures are vital.

TABLE II

Fatalities: Indirectly Due To Football - 1931 - 1990*

Year	SANDLOT Indirect	PRO AND SEMIPRO Indirect	HIGH SCHOOL Indirect	COLLEGE Indirect	TOTAL Indirect
**1931-1959	72	12	112	28	224
1960	0	0	2	2	4
1961	4	1	11	0	16
1962	0	1	4	2	7
1963	2	0	4	2	8
1964	3	0	12	1	16
1965	4	1	14	5	24
1966	0	0	6	2	8
1967	0	0	4	1	5
1968	2	0	8	2	12
1969	3	1	8	3	15
1970	0	0	12	2	14
1971	2	1	7	2	12
1972	0	0	10	1	11
1973	0	0	5	3	8
1974	0	0	5	3	8
1975	2	0	3	3	8
1976	1	0	7	2	10
1977	0	0	6	0	6
1978	0	0	8	1	9
1979	1	0	8	1	10
1980	0	0	4	0	4
1981	0	0	6	0	6
1982	1	0	7	3	11
1983	0	0	6	3	9
1984	0	0	3	0	3
1985	0	0	1	1	2
1986	0	0	7	1	8
***1987	0	0	3	3	6
1988	1	0	10	0	11
1989	0	0	9	2	11
1990	0	0	3	3	6
TOTALS	98	17	315	82	512

* No study was made in 1942.
** Yearly totals available from past reports.
*** 1987 data changed due to additional information.

11. An increasing number of medical personnel are now using a new treatment for heat illness. The method involves applying either alcohol or cool water to the victim's skin and is followed by vigorous fanning. The fanning causes evaporation and cooling. (Source: The First Aider-September 1987)

Recommendations

Specific recommendations resulting from the 1990 survey data are as follows:

1. Mandatory medical examinations and medical history should be taken before allowing an athlete to participate in football. The NCAA recommends a thorough medical examination when the athlete first enters the college athletic program and an annual health history update with use of referral exams when warranted. If the physician or coach has any questions about the athlete's readiness to participate, the athlete should not be allowed to play. High school coaches should follow the recommendations set by their state high school athletic associations.

2. All personnel concerned with training football athletes should emphasize proper, gradual, and complete physical conditioning. Particular emphasis should be placed on neck strengthening exercises.

3. A physician should be present at all games and practice sessions. If it is impossible for a physician to be present at all practice sessions, emergency measures must be provided.

4. All personnel associated with football participation should be cognizant of the problems and safety measures related to physical activity in hot weather.

5. Each institution should strive to have a team trainer who is a regular member of the faculty and is adequately prepared and qualified.

6. Cooperative liaison should be maintained by all groups interested in the field of Athletic Medicine (coaches, trainers, physicians, manufacturers, administrators, and so forth).

7. There should be strict enforcement of game rules, and administrative regulations should be enforced to protect the health of the athlete. Coaches and school officials must support the game officials in their conduct of the athletic contests.

8. There should be a renewed emphasis on employing well-trained athletic personnel, providing excellent facilities, and securing the safest and best equipment possible.

9. There should be continued research concerning the safety factor in football (rules, facilities, equipment, and so forth).

10. Coaches should continue to teach and emphasize the proper fundamentals of blocking and tackling to help reduce head and neck fatalities. *Keep the head out of football.*

11. Strict enforcement of the rules of the game by both coaches and officials will help reduce serious injuries.

12. When a player has experienced or shown signs of head trauma (loss of consciousness, visual disturbances, headache, inability to walk correctly, obvious disorientation, memory loss), he should receive immediate medical attention and should not be allowed to return to practice or game without permission from the proper medical authorities.

TABLE III

Direct Fatalities Incidence Per 100,000 1931 - 1990*

YEAR	HIGH SCHOOL	COLLEGE
**1931-1959		
1960	1.78	1.53
1961	1.62	9.23
1962	1.94	0.00
1963	1.94	3.04
1964	2.23	4.56
1965	2.00	1.33
1966	2.00	0.00
1967	1.60	4.00
1968	2.60	6.60
1969	1.64	1.33
1970	1.92	4.00
1971	1.25	4.00
1972	1.33	2.67
1973	0.58	0.00
1974	0.83	1.33
1975	1.08	1.33
1976	1.00	0.00
1977	0.53	1.33
1978	0.60	0.00
1979	0.23	1.33
1980	0.69	0.00
1981	0.38	2.67
1982	0.54	0.00
1983	0.30	0.00
1984	0.30	1.33
1985	0.30	1.33
1986	0.77	1.33
1987	0.30	0.00
1988	0.46	0.00
1989	0.27	0.00
1990	0.00	0.00

* No study was made in 1942.
** Yearly totals available from past reports.

Based on 1,500,000 junior and senior high school players and 75,000 college players.

Section IV
CASE STUDIES
DIRECT FATALITIES

High School

No direct fatalities in 1990.

TABLE IV

Heat Stroke Fatalities 1931 - 1990*

YEAR	TOTAL
1931-1954	0
1955	1
1956-1958	0
1959	4
1960	3
1961	3
1962	5
1963	0
1964	4
1965	6
1966	1
1967	2
1968	5
1969	5
1970	8
1971	4
1972	7
1973	3
1974	0
1975	0
1976	1
1977	1
1978	4
1979	2
1980	1
1981	2
1982	2
1983	1
1984	3
1985	0
1986	0
1987	1
1988	2
1989	2
1990	1
TOTALS	84

* No study was made in 1942.

Section V
CASE STUDIES
INDIRECT FATALITIES

High School

A 16 year old high school football player collapsed on the field during the first day of football practice. He died an hour later at the hospital. He was 6-2 tall and weighed 270 lbs. The medical examiner listed the cause of death as cardiac arrest due to an enlarged heart. The player died August 13, 1990.

A 17 year old high school football player collapsed on the practice field while performing stretching exercises after running a lap around the field. He died later in the hospital. A preliminary autopsy report stated the player probably died from a congenital heart defect. The player died September 15, 1990.

A 17 year old high school football player had an asthma attack on the

TABLE V

Direct Fatalities 1990: Type of Activity Engaged In

TYPE OF ACTIVITY	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
No direct fatalities in 1990.					

TABLE VI

Direct Fatalities 1990: Cause Of Death

CAUSES	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
No direct fatalities in 1990.					

TABLE VII

Direct Fatalities 1990: Position Played

POSITION	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
No direct fatalities in 1990.					

TABLE VIII

Indirect Fatalities 1990: Cause of Death

CAUSES	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Heart Related	0	0	2	1	3
Heat Stroke	0	0	0	1	1
Asthma	0	0	1	0	1
Rhabdomyolysis	0	0	0	1	1
TOTALS	0	0	3	3	6

TABLE IX

Head and Cervical Spine Fatalities

YEAR	HEAD FREQUENCY	HEAD PERCENT	CERVICAL SPINE FREQUENCY	CERVICAL SPINE PERCENT
1945-1954	87	20.1	32	28.8
1955-1964	115	26.6	23	20.7
1965-1974	162	37.4	42	37.9
1975-1984	69	15.9	14	12.6
TOTALS	433	100.0	111	100.0

sidelines before a game. He died later at the hospital. He died during the first week in October.

College

A 21 year old college football player died of cardiac arrest on August 9, 1990. He collapsed on the practice field after running a series of short runs for approximately three minutes on August 7, 1990. The medical investigator listed the cause of death as exertion induced rhabdomyolysis with sickle cell trait as a possible contributing factor. Rhabdomyolysis causes the breakdown of skeletal muscles and is an extremely rare disease.

A 20 year old college football player collapsed on the practice field after a two hour workout on September 13, 1990. The 6-2, 268 lb. athlete died on September 22, 1990. At the time of his collapse his body temperature was reported as being 107 degrees. No autopsy was performed. The heat related illness led to a total system failure.

1988 Update

A high school football player who received a head injury during the 1988 football season and was in a coma, died in April of 1990. The 1988 data will be changed to indicate the player's death.

Keep The Head Out Of Football

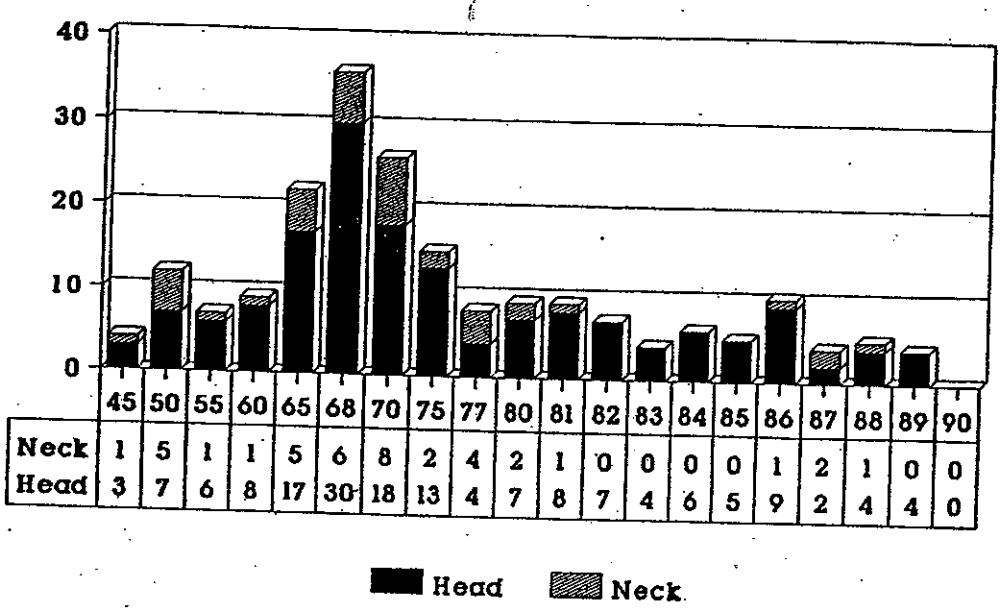
A 1976 rule change that eliminated the head as the initial contact point in blocking and tackling has significantly reduced head and neck injuries in the sport over the last decade.

Coaches can do their part to continue that trend by teaching correct techniques and emphasizing proper fundamentals at all times. That way, players can avoid catastrophic injury and coaches can avoid lawsuits.

Keep the head out of football.

Football Fatalities

Head & Neck Injuries



	45	50	55	60	65	68	70	75	77	80	81	82	83	84	85	86	87	88	89	90
Neck	1	5	1	1	5	6	8	2	4	2	1	0	0	0	0	1	2	1	0	0
Head	3	7	6	8	17	30	18	13	4	7	8	7	4	6	5	9	2	4	4	0

Adopt 'Safety First' Coaching Techniques

According to legal experts, "failure to warn" usually is one of the primary accusations made against those in the coaching profession in litigation which involves catastrophic injury to a player.

To help prevent what could result in the destruction of a coaching career, as well as massive financial loss, adopt 'safety first' coaching techniques:

1) Have a clear and complete understanding of the intent of correct application of safety rules.

2) Make graphically clear to players the risk of violating these rules and use the available 'printed' material as a constant authoritative reminder to them of the importance of correct techniques.

3) Point out in exact terms the risk of an 'accidental' catastrophic injury in athletics before the first practice begins.

Make Safety A Commitment And Your No. 1 Priority!!

Excerpted from an article by Dick Schindler for the National Federation News.

Coaches' Checklist

1) Keep the head up.

2) Discuss risk of injury.

3) Keep the head out of contact.

4) Explain how serious injuries occur.

5) Involve parents in early season meeting.

6) Have a set plan for coaching safety.

7) Clearly explain and demonstrate safe techniques.

8) Provide best medical care possible.

9) Monitor blocking and tackling techniques every day.

10) Repeat drills which stress proper and safe techniques.

11) Admonish and/or discipline users of unsafe techniques.

12) Receive clearance by doctor for athlete to play following head trauma.

13) Stress safety every day.

14) Don't glorify "head hunters".

15) Support officials who penalize illegal helmet contact.

16) Don't praise or condone illegal helmet contact.

17) Provide conditioning to strengthen neck muscles.

18) Entire staff must be "tuned in" to safety program.

19) Check helmet condition regularly.

20) Improper technique causes spinal-cord injuries.

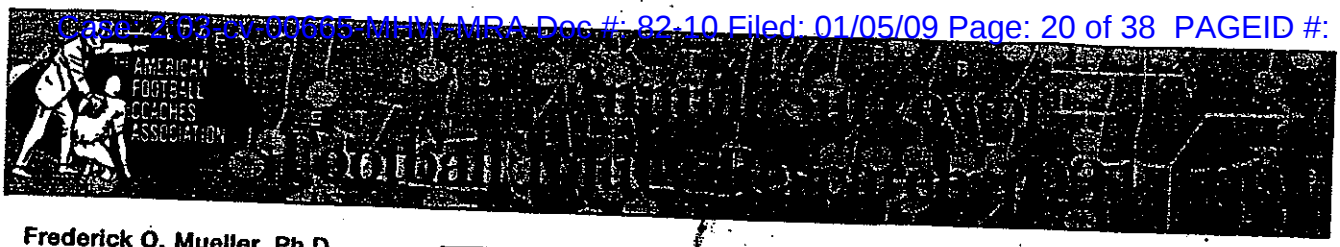
21) Helmet must fit properly.

22) Be prepared for a catastrophic injury.

23) The game doesn't need abusive contact.

24) Player safety is your responsibility.

25) It's a game — not a job — for the players.



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Prepared for:
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National Collegiate Athletic ssociation, Overland Park, Kansas.
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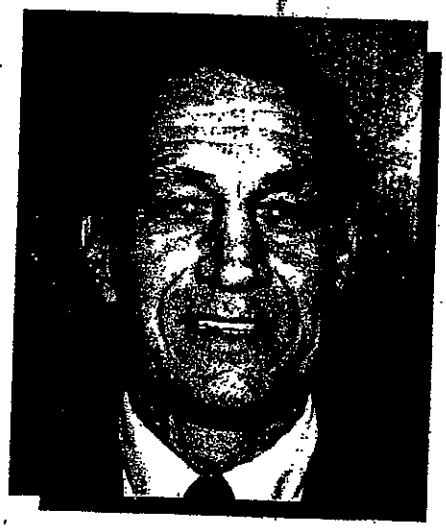
Submitted February 1992



Mueller

Schindler

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INTRODUCTION

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Direct - Those fatalities which resulted directly from participation in the fundamental skills of football.

Indirect - Those fatalities which are caused by systemic failure as a result of exertion while participating in football activity or by a complication which was secondary to a non-fatal injury.

In several instances of reported football fatalities, the respondent stated the fatality should not be attributed to football. Reasons for these statements are that the fatality was attributed to physical defects that were unrelated to football injuries.

Participation numbers were updated in the 1989 report. The National Federation of State High School Associations has estimated that there are approximately 1,500,000 high school, junior high school, and non-federation school football participants in the United States. The college figure of 75,000 participants includes the National Collegiate Athletic Association, the National Association of Intercollegiate Athletics, the National Junior College Athletic Association, and an estimate of schools not associated with any national organization. Sandlot and professional football have been estimated at 225,000 participants. These figures give an estimate of 1,800,000 total football participants in the United States for the 1991 football season.

Dr. Mueller compiled and prepared the survey report on college, professional, and sandlot levels, and Mr. Richard D. Schindler of the National Federation of State High School Association assumed complete responsibility for collecting and preparing the senior and junior high school phase of the study. Sandlot is defined as non-school football, but organized and using full protective equipment.

At the conclusion of the football season, both reports are compiled into the Annual Survey of Football Injury Research. This report is sponsored by the American Football Coaches Association, the National Collegiate Athletic Association, and the National Federation of State High School Associations.

Acknowledgements

Medical data for the 1991 report was compiled by Dr. Robert C. Cantu, Chairman, Department of Surgery and Chief, Neurosurgery Service, Emerson Hospital, in Concord, MA. Dr. Cantu is also the future President of the American College of Sports Medicine and is the Medical Director for the National Center for Catastrophic Sports Injury Research at the University of North Carolina at Chapel Hill.

Section II

SUMMARY

1. There were three fatalities directly related to football during the 1991 season. All three were associated with high school football. (Table I)

2. The incidence of direct fatal injuries is very low on a 100,000 player exposure basis. For the approximately 1,800,000 participants in 1991, the incidence of direct fatalities was 0.17 participants per 100,000 players.

3. The incidence of direct fatalities in high school and junior high school football was 0.2 participants per 100,000 players. The incidence of direct fatalities in college was 0.00 participants per 100,000 players. (Table III)

4. Most direct fatalities usually occur during regularly scheduled games and during the 1991 season all three direct fatalities occurred in games.

5. The 1991 survey shows that two of the direct fatalities occurred in September and one in October.

6. The major activities of football would naturally account for the greatest number of fatalities. In 1991, one player was injured tackling, one blocking on a kickoff, and one being tackled. (Table V)

7. In 1991 all three fatalities resulted from injuries to the head. (Table VI)

8. In many cases football cannot be directly responsible for fatal injuries (heat stroke, heart failure and so forth). In 1991 there were four indirect fatalities. Three were associated with high school football and one was associated with college football. All of the high school indirect deaths were related to heart failure. The one college indirect fatality was also related to heart failure. (Table VIII)

9. There were two college fatalities that should not be related to football. One player died one day after he became ill with a bacterial virus, and the second player fractured a leg and died suddenly from lung hemorrhaging associated with the injury.

10. Lightning continues to be a problem. In 1991 an assistant high school football coach was killed when lightning struck the practice field. Two other coaches suffered minor injuries, and a player was in serious condition at the hospital.

Section III

Discussion and Recommendations

After a slight rise in the number of football fatalities during the 1986 season, the 1990 data revealed the elimination of direct football fatalities. That was the first time in the past 59 years that there have been no direct football fatalities. The 1991 data show three fatalities at the high school level. The 1990 and 1991 data illustrate the importance of data collection and the analysis of this data in making changes in the game of football that help reduce the incidence of serious injuries. An all out effort must be made to keep these figures low and to strive for the elimination of football fatalities.

Head and Neck Injuries

Past efforts that were successful in reducing fatalities to the level indicated in the 1979, 1983, 1984, 1985, 1987, 1989, 1991 data and the elimination of direct fatalities in 1990 should again be emphasized. Rule changes for the 1976 football season which eliminated the head as a primary and initial contact area for blocking and tackling is of utmost importance. Since 1960 most of the direct fatalities have been caused by head and neck injuries. We must continue to reduce head and neck injuries.

Several suggestions for reducing head and neck injuries are as follows:

1. Athletes must be given proper conditioning exercises which will strengthen their necks so that participants will be able to hold their heads firmly erect when making contact.

2. Coaches should drill the athletes in the proper execution of the fundamental football skills, particularly blocking and

TABLE I

Fatalities: Directly Due To Football - 1931 - 1991*

Year	SANDLOT Direct	PRO AND SEMIPRO Direct	HIGH SCHOOL Direct	COLLEGE Direct	TOTAL Direct
**1931-1959	115	68	262	41	486
1960	1	1	11	1	14
1961	3	0	10	6	19
1962	6	1	12	0	19
1963	1	1	12	2	16
1964	4	1	21	3	29
1965	4	0	20	1	25
1966	4	0	20	0	24
1967	5	0	16	3	24
1968	4	1	26	5	36
1969	3	1	18	1	23
1970	3	0	23	3	29
1971	2	0	15	3	20
1972	3	1	16	2	22
1973	2	0	7	0	9
1974	0	0	10	1	11
1975	1	0	13	1	15
1976	3	0	15	0	18
1977	1	0	8	1	10
1978	0	0	9	0	9
1979	0	0	3	1	4
1980	0	0	9	0	9
1981	2	0	5	2	9
1982	2	0	7	0	9
1983	0	0	4	0	4
1984	1	0	4	1	6
1985	2	0	4	1	7
1986	0	0	10	1	11
1987	0	0	4	0	4
1988	0	0	7	0	7
1989	0	0	4	0	4
1990	0	0	0	0	0
1991	**0**	**0**	**3**	**0**	**3**
TOTALS	**172**	**75**	**608**	**80**	**935**

* No study was made in 1942.
** Yearly totals available from past reports.

tackling. Contact should always be made with the head up and never with the top of the head/helmet. Initial contact should never be made with the head/helmet.

3. Coaches and officials should discourage the players from using their heads as battering rams when blocking and tackling. The rules prohibiting spearing should be enforced in practice and in games. The players should be taught to respect the helmet as a protective device and that the helmet should not be used as a weapon.

4. All coaches, physicians, and trainers should take special care to see that the player's equipment is properly fitted, particularly the helmet.

5. When a player has experienced or shown signs of head trauma (loss of consciousness, visual disturbances, headache, inability to walk correctly, obvious disorientation, memory loss), he should receive immediate medical attention and should not be allowed to return to practice or game without permission from the proper medical authorities.

Another important effort has been and continues to be the improvement of football protective equipment. It is imperative that old and worn equipment be properly renovated or discarded and continued emphasis be placed on developing the best equipment possible. Manufacturers, coaches, trainers, and physicians should continue their joint and individual efforts toward this end.

The authors of this research are convinced that the current rules which eliminate the head in blocking and tackling, the helmet research conducted by NOCSAE, excellent physical conditioning and proper medical supervision have played the primary role in reducing fatalities and serious head and neck injuries in football. This is best illustrated by Table IX and Graph I which shows the increase in both head and cervical spine fatalities during the decade from 1965-1974. This time period was associated with blocking and tackling techniques that involved the head as the initial point of contact. The reduction in head and cervical spine injuries is down in the decade from 1975-1984. This decade was associated with the 1976 rule change that eliminated the head as the initial contact point in blocking and tackling. There is no doubt that the 1976 rule change has made a difference and that a continued effort should be made to keep the head out of the fundamental skills of football.

Heat Stroke

A continuous effort should be made to eliminate heat stroke deaths associated with football. Since the beginning of the survey through 1959 there were five cases of heat stroke death reported. From 1960 through 1991 there have been seventy-nine heat stroke cases which resulted in death (Table IV).

Since 1974 there has been a dramatic reduction in heat stroke deaths with the exception of 1978 when there were four. There were no heat stroke deaths in 1991. All coaches, trainers, and physicians should continue their efforts toward eliminating athletic fatalities which result from physical activities in hot weather.

Heat stroke and heat exhaustion are prevented by careful control of various factors in the conditioning program of the athlete. When football activity is carried on in hot weather, the following suggestions and precautions should be taken:

1. Each athlete should have a complete physical examination with medical history and an annual health history update. History of previous heat illness and type of training activities before organized practice begins should be included.

2. Acclimatize athletes to heat gradually by providing graduated practice sessions for the first seven to ten days and other abnormally hot or humid days.

3. Know both the temperature and the humidity since it is more difficult for the body to cool itself in high humidity. Use of a sling psychrometer is recommended to measure the relative humidity and anytime the wet-bulb temperature is over 78 degrees practice should be altered.

4. Adjust activity level and provide frequent rest periods. Rest in cool shaded areas with some air movement and remove helmets and loosen or remove jerseys. Rest periods of 15-30 minutes should be provided during workouts of one hour.

TABLE II

Fatalities: Indirectly Due To Football - 1931 - 1991*

Year	SANDLOT Indirect	PRO AND SEMIPRO Indirect	HIGH SCHOOL Indirect	COLLEGE Indirect	TOTAL Indirect
**1931-1959	72	12	112	28	224
1960	0	0	2	2	4
1961	4	1	11	0	16
1962	0	1	4	2	7
1963	2	0	4	2	8
1964	3	0	12	1	16
1965	4	1	14	5	24
1966	0	0	6	2	8
1967	0	0	4	1	5
1968	2	0	8	2	12
1969	3	1	8	3	15
1970	0	0	12	2	14
1971	2	1	7	2	12
1972	0	0	10	1	11
1973	0	0	5	3	8
1974	0	0	5	3	8
1975	2	0	3	3	8
1976	1	0	7	2	10
1977	0	0	6	0	6
1978	0	0	8	1	9
1979	1	0	8	1	10
1980	0	0	4	0	4
1981	0	0	6	0	6
1982	1	0	7	3	11
1983	0	0	6	3	9
1984	0	0	3	0	3
1985	0	0	1	1	2
1986	0	0	7	1	8
1987	0	0	3	3	6
1988	1	0	10	0	11
1989	0	0	9	2	11
1990	0	0	3	3	6
1991	0	0	3	1	4
TOTALS	98	17	318	83	516

* No study was made in 1942.
** Yearly totals available from past reports.

5. Provide adequate cold water replacement during practice. Water should always be available and in unlimited quantities to the athletes. GIVE WATER REGULARLY.

6. Salt should be replaced daily and liberal salting of the athletes' food will accomplish this purpose. Coaches should not provide salt tablets to athletes. Attention must be directed to water replacement.

7. Athletes should weigh in each day before and after practice and weight charts checked in order to treat the athlete who loses excessive weight each day. Generally, a three percent body weight loss through sweating is safe, and a five percent loss is in the danger zone.

8. Clothing is important and a player should avoid use of long sleeves, long stockings, and any excess clothing. Never use rubberized clothing or sweatsuits.

9. Some athletes are more susceptible to heat injury. These individuals are not accustomed to work in the heat, may be overweight, and may be the eager athlete who constantly competes at his capacity. Athletes with previous heat problems should be watched closely.

10. It is important to observe for signs of heat illness. Some trouble signs are nausea, incoherence, fatigue, weakness, vomiting, cramps, weak rapid pulse, flushed appearance, visual disturbance, and unsteadiness. If heat illness is suspected, seek a physician's immediate service. Recommended emergency procedures are vital.

11. An increasing number of medical personnel are now using a new treatment for heat illness. The method involves applying either alcohol or cool water to the victim's skin and is followed by vigorous fanning. The fanning causes evaporation and cooling. (Source: The First Aider-September 1987)

TABLE III

Direct Fatalities Incidence Per 100,000 1931 - 1991*

YEAR	HIGH SCHOOL	COLLEGE
**1931-1959		
1960	1.78	1.53
1961	1.62	9.23
1962	1.94	0.00
1963	1.94	3.04
1964	2.23	4.56
1965	2.00	1.33
1966	2.00	0.00
1967	1.60	4.00
1968	2.60	6.60
1969	1.64	1.33
1970	1.92	4.00
1971	1.25	4.00
1972	1.33	2.67
1973	0.58	0.00
1974	8.83	1.33
1975	1.08	1.33
1976	1.00	0.00
1977	0.53	1.33
1978	0.60	0.00
1979	0.23	1.33
1980	0.69	0.00
1981	0.38	2.67
1982	0.54	0.00
1983	0.30	0.00
1984	0.30	1.33
1985	0.30	1.33
1986	0.77	1.33
1987	0.30	0.00
1988	0.46	0.00
1989	0.27	0.00
1990	0.00	0.00
1991	0.20	0.00

* No study was made in 1942.
** Yearly totals available from past reports.

Based on 1,500,000 junior and senior high school players and 75,000 college players.

Recommendations

Specific recommendations resulting from the 1991 survey data are as follows:

1. Mandatory medical examinations and medical history should be taken before allowing an athlete to participate in football. The NCAA recommends a thorough medical examination when the athlete first enters the college athletic program and an annual health history update with the use of referral exams when warranted. If the physician or coach has any questions about the athlete's readiness to participate, the athlete should not be allowed to play. High school coaches should follow the recommendations set by their state high school athletic associations.

2. All personnel concerned with training football athletes should emphasize proper, gradual, and complete physical conditioning. Particular emphasis should be placed on neck strengthening exercises.

3. A physician should be present at all games and practice sessions. If it is impossible for a physician to be present at all practice sessions, emergency measures must be provided.

4. All personnel associated with football participation should be cognizant of the problems and safety measures related to physical activity in hot weather.

5. Each institution should strive to have a team trainer who is a regular member of the faculty and is adequately prepared and qualified.

6. Cooperative liaison should be maintained by all groups interested in the field of Athletic Medicine (coaches, trainers, physicians, manufacturers, administrators, and so forth).

7. There should be strict enforcement of game rules, and administrative regulations should be enforced to protect the health of the athlete. Coaches and school officials must support the game officials in their conduct of the athletic contests.

TABLE IV

Heat Stroke Fatalities 1931 - 1991*

YEAR	TOTAL
1931-1954	0
1955	1
1956-1958	0
1959	4
1960	3
1961	3
1962	5
1963	0
1964	4
1965	6
1966	1
1967	2
1968	5
1969	5
1970	8
1971	4
1972	7
1973	3
1974	0
1975	0
1976	1
1977	1
1978	4
1979	2
1980	1
1981	2
1982	2
1983	1
1984	3
1985	0
1986	0
1987	1
1988	2
1989	2
1990	1
1991	0
TOTALS	84

* No study was made in 1942.

8. There should be a renewed emphasis on employing well-trained athletic personnel, providing excellent facilities, and securing the safest and best equipment possible.

9. There should be continued research concerning the safety factor in football (rules, facilities, equipment, and so forth).

10. Coaches should continue to teach and emphasize the proper fundamentals of blocking and tackling to help reduce head and neck fatalities. KEEP THE HEAD OUT OF FOOTBALL.

11. Strict enforcement of the rule of the game by both coaches and officials will help reduce serious injuries.

12. When a player has experienced or shown signs of head trauma (loss of

TABLE V

Direct Fatalities 1991: Type of Activity Engaged In

TYPE OF ACTIVITY	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Tackling	0	0	1	0	1
Tackled	0	0	1	0	1
Blocking — Kick-off	0	0	1	0	1
TOTALS	0	0	3	0	3

TABLE VI

Direct Fatalities 1991: Cause Of Death

CAUSES	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Head Injury	0	0	3	0	3
TOTALS	0	0	3	0	3

TABLE VII

Direct Fatalities 1991: Position Played

POSITION	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Running Back	0	0	1	0	1
Kick-off Return Team	0	0	1	0	1
Defense	0	0	1	0	1
TOTALS	0	0	3	0	3

TABLE VIII

Indirect Fatalities 1991: Cause of Death

CAUSES	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Heart Related	0	0	3	1	4
TOTALS	0	0	3	1	4

TABLE IX

Head and Cervical Spine Fatalities

YEAR	HEAD FREQUENCY	HEAD PERCENT	CERVICAL SPINE FREQUENCY	CERVICAL SPINE PERCENT
1945-1954	87	20.1	32	28.8
1955-1964	115	26.6	23	20.7
1965-1974	162	37.4	42	37.9
1975-1984	69	15.9	14	12.6
TOTALS	433	100.0	111	100.0

consciousness, visual disturbances, headache, inability to walk correctly, obvious disorientation, memory loss), he should receive immediate medical attention and should not be allowed to return to practice or game without permission from the proper medical authorities.

Section IV
CASE STUDIES
DIRECT FATALITIES
High School

A 17 year old high school football player was injured in a game on September 20, 1991 and died on September 25, 1991. Two plays before he collapsed on the field he complained to teammates that he felt dizzy. Two plays later he ran into the quarterback on a play where he was supposed to carry the ball. he died from a subdural hematoma.

A 17 year old high school football player was injured on September 27, 1991 and died on October 4, 1991 after he was injured in a game. He collapsed on the field after he received a hard hit while attempting to block an opponent on a first quarter kick-off. Cause of death was a subdural hematoma.

A high school football player was injured in a game on September 7, 1991 and died on September 8, 1991. he was making a tackle at the time of the injury and received a head injury.

Section V
CASE STUDIES
INDIRECT FATALITIES
High School

On January 22, a high school football player was being timed in a mile run. He could not finish the run and collapsed while walking back to the field house. Cause of death was congenital hypoplasia of the aorta. He was 16 years old.

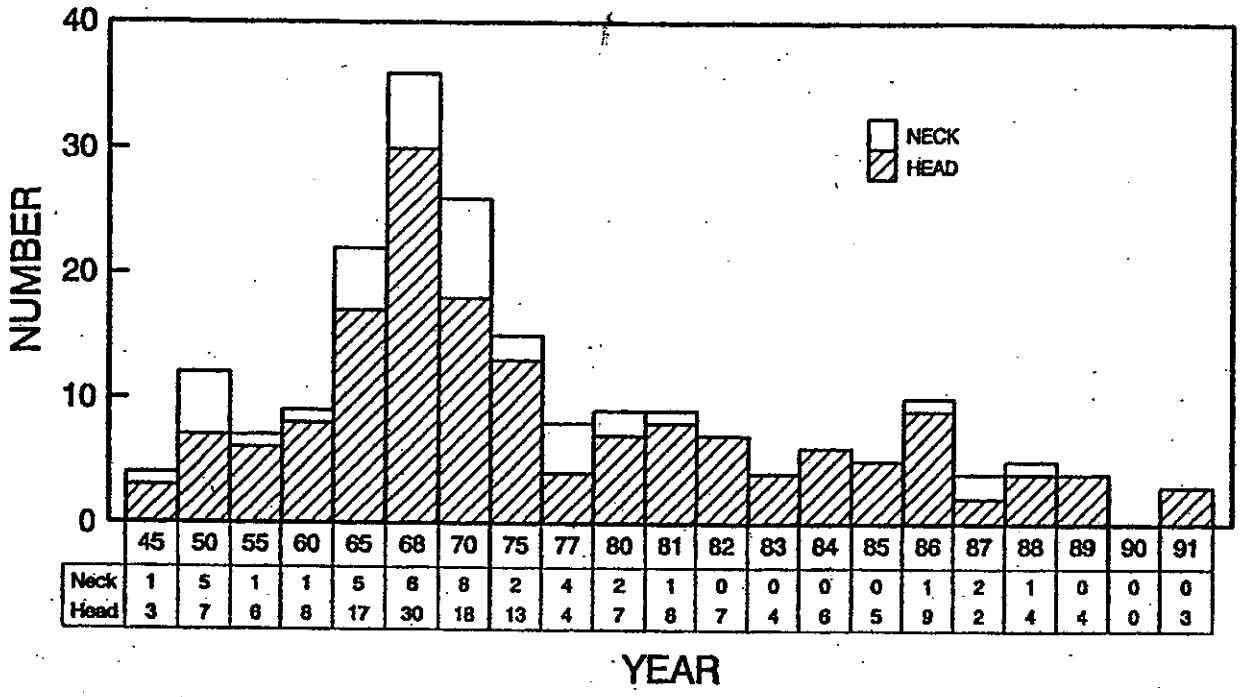
A high school football player collapsed and died after a running drill on September 9, 1991. He was 15 years old. Cause of death was heart failure.

A 13 year old middle school football player died after collapsing at football practice on September 25, 1991. Cause of death was listed as a disrupted heart rhythm but the autopsy showed no apparent cause for the disruption.

College

A 19 year old college freshman football player collapsed shortly before practice on September 25, 1991 and died. He was involved in pre-practice warm-up. Cause of death was heart failure. He did have a history of a minor heart problem while in high school.

FOOTBALL FATALITIES
HEAD AND NECK INJURIES



	45	50	55	60	65	68	70	75	77	80	81	82	83	84	85	86	87	88	89	90	91
Neck	1	5	1	1	5	6	8	2	4	2	1	0	0	0	0	1	2	1	0	0	0
Head	3	7	6	8	17	30	18	13	4	7	8	7	4	6	5	9	2	4	4	0	3

Adopt 'Safety First' Coaching Techniques

According to legal experts, "failure to warn" usually is one of the primary accusations made against those in the coaching profession in litigation which involves catastrophic injury to a player.

To help prevent what could result in the destruction of a coaching career, as well as massive financial loss, adopt 'safety first' coaching techniques:

1) Have a clear and complete understanding of the intent of correct application of safety rules.

2) Make graphically clear to players the risk of violating these rules and use the available 'printed' material as a constant authoritative reminder to them of the importance of correct techniques.

3) Point out in exact terms the risk of an 'accidental' catastrophic injury in athletics before the first practice begins.

Make Safety A Commitment And Your No. 1 Priority!

Excerpted from an article by Dick Schindler for the National Federation News.

Coaches' Checklist

1) Keep the head up.
2) Discuss risk of injury.
3) Keep the head out of contact.
4) Explain how serious injuries occur.
5) Involve parents in early season meeting.
6) Have a set plan for coaching safety.
7) Clearly explain and demonstrate safe techniques.
8) Provide best medical care possible.
9) Monitor blocking and tackling techniques every day.
10) Repeat drills which stress proper and safe techniques.
11) Admonish and/or discipline users of unsafe techniques.
12) Receive clearance by doctor for athlete to play following head trauma.
13) Stress safety every day.
14) Don't glorify "head hunters".
15) Support officials who penalize illegal helmet contact.
16) Don't praise or condone illegal helmet contact.
17) Provide conditioning to strengthen neck muscles.
18) Entire staff must be "tuned in" to safety program.
19) Check helmet condition regularly.
20) Improper technique causes spinal-cord injuries.
21) Helmet must fit properly.
22) Be prepared for a catastrophic injury.
23) The game doesn't need abusive contact.
24) Player safety is your responsibility.
25) It's a game — not a job — for the players.

Keep The Head Out Of Football

A 1976 rule change that eliminated the head as the initial contact point in blocking and tackling has significantly reduced head and neck injuries in the sport over the last decade.

Coaches can do their part to continue that trend by teaching correct techniques and emphasizing proper fundamentals at all times. That way, players can avoid catastrophic injury and coaches can avoid lawsuits.

Keep the head out of football.

Annual Survey of Football Injury Research 1931-1992

Annual Survey of Football Injury Research

Frederick O. Mueller, Ph.D.
Chairman, American Football Coaches Committee on Football Injuries
and
Richard D. Schindler
Assistant Director of the National Federation of State High School Associations

Prepared for:
American Football Coaches Association, Orlando, Florida; National Collegiate Athletic Association, Overland Park, Kansas; National Federation of State High School Associations, Kansas City, Missouri.

Submitted February 1993

Mueller

Schindler

Section I
INTRODUCTION

In 1931 the American Football Coaches Association initiated the First Annual Survey of Football Fatalities. The original survey committee was chaired by Marvin A. Stevens, M.D., of Yale University, who served from 1931-1942. Floyd R. Eastwood, Ph.D., Purdue University, succeeded Dr. Stevens in 1942 and served through 1964.

Carl S. Blyth, Ph.D., University of North Carolina at Chapel Hill, was appointed in 1965 and served through the 1979 football season. In January 1980, Frederick O. Mueller, Ph.D., University of North Carolina at Chapel Hill, was appointed by the American Football Coaches Association and the National Collegiate Athletic Association to continue this research under the new title, Annual Survey of Football Injury Research.

The primary purpose of the Annual Survey of Football Injury Research is to make the game of football a safer and, therefore, a more enjoyable sports activity. Because of these surveys, the game of football has realized many benefits in regard to rule changes, improvement of equipment, and improved coaching techniques. The 1976 rule change that made it illegal to make initial contact with the head while blocking and tackling was the direct result of this research.

The 1990 report was historic in that it was the first year since the beginning of the research, 1931, that there was not a direct fatality in football at any level of play. This clearly illustrates that data collection and analysis is important and plays a major role in injury prevention.

Data Collection

Throughout the year, upon notification of a suspected football fatality, immediate contact is made with the appropriate officials (coaches, administrators, physicians, trainers). Pertinent information is collected through questionnaires and personal contact.

Football fatalities are classified for this report as direct and indirect. The criteria used to classify football fatalities are as follows:

Direct - Those fatalities which resulted directly from participation in the fundamental skills of football.

Indirect - Those fatalities which are caused by systemic failure as a result of exertion while participating in football activity or by a complication which was secondary to a non-fatal injury.

In several instances of reported football fatalities, the respondent stated the fatality should not be attributed to football. Reasons for these statements are that the fatality was attributed to physical defects that were unrelated to football injuries.

Participation numbers were updated in the 1989 report. The National Federation of State High School Associations has estimated that there are approximately 1,500,000 high school, junior high school, and non-federation school football participants in the United States. The college figure of 75,000 participants includes the National Collegiate Athletic Association, the National Association of Inter-collegiate Athletics, the National Junior College Athletic Association, and an estimate of schools not associated with any national organization. Sandlot and professional football have been estimated at 225,000 participants. These figures give an estimate of 1,800,000 total football participants in the United States for the 1992 football season.

Dr. Mueller compiled and prepared the survey report on college, professional, and sandlot levels, and Mr. Richard D. Schindler of the National Federation of State High School Association assumed responsibility for collecting and preparing the senior and junior high school phase of the study. Sandlot is defined as non-school football, but organized and using full protective equipment.

At the conclusion of the football season, both reports are compiled into the **Annual Survey of Football Injury Research**. This report is sponsored by the American Football Coaches Association, the National Collegiate Athletic Association, and the National Federation of State High School Associations.

EXHIBIT 7

Acknowledgements

Medical data for the 1992 report was compiled by Dr. Robert C. Cantu, Chairman, Department of Surgery and Chief, Neurosurgery Service, Emerson Hospital, in Concord, MA. Dr. Cantu is the President of the American College of Sports Medicine and is the Medical Director for the National Center for Catastrophic Sports Injury Research at the University of North Carolina at Chapel Hill.

Section II

SUMMARY

1. There was one fatality directly related to football during the 1992 football season and it was associated with high school football. (Table I)

2. The rate of direct fatal injuries is very low on a 100,000 player exposure basis. For the approximately 1,800,000 participants in 1992, the rate of direct fatalities was 0.06 participants per 100,000 players.

3. The rate of direct fatalities in high school and junior high school football was 0.07 participants per 100,000 players. The rate of direct fatalities in college was 0.00 participants per 100,000 players. (Table III)

4. Most direct fatalities usually occur during regularly scheduled games. In 1992, the one direct fatality occurred in a practice scrimmage.

5. The 1992 survey shows that the one direct fatality occurred in August.

6. The major activities in football would naturally account for the greatest number of fatalities. In 1992 the direct fatality was related to tackling. (Table V)

7. In 1992 the one direct fatality resulted from injuries to the head. (Table VI)

8. In many cases football cannot be directly responsible for fatal injuries (heat stroke, heart related and so forth). In 1992 there were eleven indirect fatalities. Nine were associated with high school football, one was associated with college football and one was associated with youth league football. Five of the high school indirect deaths were heart related, one to heat, one to a rare bacterial disease, one to an aneurysm and the cause of one was unknown. The college indirect fatality was heart related and the youth indirect fatality was related to a seizure. (Table VIII)

9. There was one high school fatality that was not related to football. The player died after knee surgery due to complications of pneumonia, asthma and scar tissue on the wall of the heart.

10. In addition to the above fatalities, a high school football player died while attending a football camp in June of 1992. His death was heart related.

Section III

Discussion and Recommendations

After a slight rise in the number of football fatalities during the 1986 season, the 1990 data revealed the elimination of direct football fatalities. That was the first time in the past 59 years that there have been no direct football fatalities. There were three fatalities in 1991 and the 1992 data show one direct fatality at the high school level. The 1990,1991 and 1992 data illustrate the importance of data collection and the analysis of this data in making changes in the game of football that help reduce the incidence of serious injuries. An all out effort must be made to keep these figures low and to strive for the elimination of football fatalities.

Head and Neck Injuries

Past efforts that were successful in reducing fatalities to the level indicated in the 1979, 1983, 1984, 1985, 1987, 1989, 1991 and 1992 data and the elimination of direct fatalities in 1990 should again be emphasized. Rule changes for the 1976 football season which eliminated the head as a primary and initial contact area for blocking and tackling is of utmost importance. Since 1960 most of the direct fatalities have been caused by head and neck injuries. We must continue to reduce head and neck injuries.

Several suggestions for reducing head and neck injuries are as follows:

1. Athletes must be given proper conditioning exercises which will strengthen their necks so that participants will be able to hold their heads firmly erect when making contact.

2. Coaches should drill the athletes in

TABLE I

Fatalities: Directly Due To Football - 1931 - 1992*

Year	SANDLOT Direct	PRO AND SEMIPRO Direct	HIGH SCHOOL Direct	COLLEGE Direct	TOTAL Direct
**1931-1959	115	68	262	41	486
1960	1	1	11	1	14
1961	3	0	10	6	19
1962	6	1	12	0	19
1963	1	1	12	2	16
1964	4	1	21	3	29
1965	4	0	20	1	25
1966	4	0	20	0	24
1967	5	0	16	3	24
1968	4	1	26	5	36
1969	3	1	18	1	23
1970	3	0	23	3	29
1971	2	0	15	3	20
1972	3	1	16	2	22
1973	2	0	7	0	9
1974	0	0	10	1	11
1975	1	0	13	1	15
1976	3	0	15	0	18
1977	1	0	8	1	10
1978	0	0	9	0	9
1979	0	0	3	1	4
1980	0	0	9	0	9
1981	2	0	5	2	9
1982	2	0	7	0	9
1983	0	0	4	0	4
1984	1	0	4	1	6
1985	2	0	4	1	7
1986	0	0	10	1	11
1987	0	0	4	0	4
1988	0	0	7	0	7
1989	0	0	4	0	4
1990	0	0	0	0	0
1991	0	0	3	0	3
1992	0	0	1	0	1
TOTALS	172	75	609	80	936

* No study was made in 1942.
** Yearly totals available from past reports.

the proper execution of the fundamental football skills, particularly blocking and tackling. **Contact should always be made with the head up and never with the top of the head/helmet. Initial contact should never be made with the head/helmet.**

3. Coaches and officials should discourage the players from using their heads as battering rams when blocking and tackling. The rules prohibiting spearing should be enforced in practice and in games. The players should be taught to respect the helmet as a protective device and that the helmet should not be used as a weapon.

4. All coaches, physicians, and trainers should take special care to see that the player's equipment is properly fitted, particularly the helmet.

5. When a player has experienced or shown signs of head trauma (loss of consciousness, visual disturbances, headache, inability to walk correctly, obvious disorientation, memory loss), he should receive immediate medical attention and should not be allowed to return to practice or game without permission from the proper medical authorities.

Another important effort has been and continues to be the improvement of football protective equipment. It is imperative that old and worn equipment be properly renovated or discarded and continued emphasis be placed on developing the best equipment possible. Manufacturers, coaches, trainers, and physicians should continue their joint and individual efforts toward this end.

The authors of this research are convinced that the current rules which eliminate the head in blocking and tackling, coaches teaching the proper fundamentals of blocking and tackling, the helmet research conducted by NOCSAE, excellent physical conditioning and proper medical supervision and a good data collection system have played the primary role in reducing fatalities and serious head and neck injuries in football. This is best illustrated by Table IX and Graph I which shows the increase in both head and cervical spine fatalities during the decade from 1965-1974. This time period was associated with blocking and tackling techniques that involved the head as the initial point of contact. The reduction in head and cervical spine injuries is down in the decade from 1975-1984. This decade was associated with the 1976 rule change that eliminated the head as the initial contact point in blocking and tackling. There is no doubt that the 1976 rule change has made a difference and that a continued effort should be made to keep the head out of the fundamental skills of football.

Heat Stroke

A continuous effort should be made to eliminate heat stroke deaths associated with football. Since the beginning of the survey through 1959 there were five cases of heat stroke death reported. From 1960 through 1992 there have been eighty heat stroke cases which resulted in death (Table IV).

Since 1974 there has been a dramatic reduction in heat stroke deaths with the exception of 1978 when there were four. There was one heat stroke death in 1992. All coaches, trainers, and physicians should continue their efforts toward eliminating athletic fatalities which result from physical activities in hot weather.

Heat stroke and heat exhaustion are prevented by careful control of various factors in the conditioning program of the athlete. When football activity is carried on in hot weather, the following suggestions and precautions should be taken:

1. Each athlete should have a complete physical examination with medical history and an annual health history update. History of previous heat illness and type of training activities before organized practice begins should be included.

2. Acclimatize athletes to heat gradually by providing graduated practice sessions for the first seven to ten days and other abnormally hot or humid days.

3. Know both the temperature and the humidity since it is more difficult for the body to cool itself in high humidity. Use of a sling psychrometer is recommended to measure the relative humidity and anytime the wet-bulb temperature is over 78 degrees practice should be altered.

TABLE II

Fatalities: Indirectly Due To Football - 1931 - 1992*

Year	SANDLOT Indirect	PRO AND SEMIPRO Indirect	HIGH SCHOOL Indirect	COLLEGE Indirect	TOTAL Indirect
**1931-1959	72	12	112	28	224
1960	0	0	2	2	4
1961	4	1	11	0	16
1962	0	1	4	2	7
1963	2	0	4	2	8
1964	3	0	12	1	16
1965	4	1	14	5	24
1966	0	0	6	2	8
1967	0	0	4	1	5
1968	2	0	8	2	12
1969	3	1	8	3	15
1970	0	0	12	2	14
1971	2	1	7	2	12
1972	0	0	10	1	11
1973	0	0	5	3	8
1974	0	0	5	3	8
1975	2	0	3	3	8
1976	1	0	7	2	10
1977	0	0	6	0	6
1978	0	0	8	1	9
1979	1	0	8	1	10
1980	0	0	4	0	4
1981	0	0	6	0	6
1982	1	0	7	3	11
1983	0	0	6	3	9
1984	0	0	3	0	3
1985	0	0	1	1	2
1986	0	0	7	1	8
1987	0	0	3	3	6
1988	1	0	10	0	11
1989	0	0	9	2	11
1990	0	0	3	3	6
1991	0	0	3	1	4
1992	1	0	9	1	11
TOTALS	99	17	327	84	527

* No study was made in 1942.
** Yearly totals available from past reports.

4. Adjust activity level and provide frequent rest periods. Rest in cool shaded areas with some air movement and remove helmets and loosen or remove jerseys. Rest periods of 15-30 minutes should be provided during workouts of one hour.

5. Provide adequate cold water replacement during practice. Water should always be available and in unlimited quantities to the athletes. GIVE WATER REGULARLY.

6. Salt should be replaced daily and liberal salting of the athletes' food will accomplish this purpose. Coaches should not provide salt tablets to athletes. Attention must be directed to water replacement.

7. Athletes should weigh in each day before and after practice and weight charts checked in order to treat the athlete who loses excessive weight each day. Generally, a three percent body weight loss through sweating is safe, and a five percent loss is in the danger zone.

8. Clothing is important and a player should avoid use of long sleeves, long stockings, and any excess clothing. Never use rubberized clothing or sweatsuits.

9. Some athletes are more susceptible to heat injury. These individuals are not accustomed to work in the heat, may be overweight, and may be the eager athlete who constantly competes at his capacity. Athletes with previous heat problems should be watched closely.

10. It is important to observe for signs of heat illness. Some trouble signs are nausea, incoherence, fatigue, weakness, vomiting, cramps, weak rapid pulse, flushed appearance, visual disturbance, and unsteadiness. If heat illness is suspected, seek a physician's immediate service. Recommended emergency procedures are vital.

11. An increasing number of medical personnel are now using a new treatment for heat illness. The method involves applying either alcohol or cool water to the victim's skin and is followed by vigorous fanning. The fanning causes evaporation and cooling. (Source: The First Alder-September 1987)

TABLE III

Direct Fatalities Incidence Per 100,000 1931 - 1992*

YEAR	HIGH SCHOOL	COLLEGE
**1931-1959		
1960	1.78	1.53
1961	1.62	9.23
1962	1.94	0.00
1963	1.94	3.04
1964	2.23	4.56
1965	2.00	1.33
1966	2.00	0.00
1967	1.60	4.00
1968	2.60	6.60
1969	1.64	1.33
1970	1.92	4.00
1971	1.25	4.00
1972	1.33	2.67
1973	0.58	0.00
1974	8.83	1.33
1975	1.08	1.33
1976	1.00	0.00
1977	0.53	1.33
1978	0.60	0.00
1979	0.23	1.33
1980	0.69	0.00
1981	0.38	2.67
1982	0.54	0.00
1983	0.30	0.00
1984	0.30	1.33
1985	0.30	1.33
1986	0.77	1.33
1987	0.30	0.00
1988	0.46	0.00
1989	0.27	0.00
1990	0.00	0.00
1991	0.20	0.00
1992	0.07	0.00

* No study was made in 1942.
** Yearly totals available from past reports.

Based on 1,500,000 junior and senior high school players and 75,000 college players.

Recommendations

Specific recommendations resulting from the 1992 survey data are as follows:

1. Mandatory medical examinations and medical history should be taken before allowing an athlete to participate in football. The NCAA recommends a thorough medical examination when the athlete first enters the college athletic program and an annual health history update with the use of referral exams when warranted. If the physician or coach has any questions about the athlete's readiness to participate, the athlete should not be allowed to play. High school coaches should follow the recommendations set by their state high school athletic associations.

2. All personnel concerned with training football athletes should emphasize proper, gradual, and complete physical conditioning. Particular emphasis should be placed on neck strengthening exercises.

3. A physician should be present at all games and practice sessions. If it is impossible for a physician to be present at all practice sessions, emergency measures must be provided.

4. All personnel associated with football participation should be cognizant of the problems and safety measures related to physical activity in hot weather.

TABLE IV

Heat Stroke Fatalities 1931 - 1992*

YEAR	TOTAL
1931-1954	0
1955	1
1956-1958	0
1959	4
1960	3
1961	3
1962	5
1963	0
1964	4
1965	6
1966	1
1967	2
1968	5
1969	5
1970	8
1971	4
1972	7
1973	3
1974	0
1975	0
1976	1
1977	1
1978	4
1979	2
1980	1
1981	2
1982	2
1983	1
1984	3
1985	0
1986	0
1987	1
1988	2
1989	2
1990	1
1991	0
1992	1
TOTALS	85

* No study was made in 1942.

5. Each institution should strive to have a team trainer who is a regular member of the faculty and is adequately prepared and qualified.

6. Cooperative liaison should be maintained by all groups interested in the field of Athletic Medicine (coaches, trainers, physicians, manufacturers, administrators, and so forth).

7. There should be strict enforcement of game rules, and administrative regulations should be enforced to protect the health of the athlete. Coaches and school officials must support the game officials in their conduct of the athletic contests.

8. There should be a renewed emphasis on employing well-trained athletic personnel, providing excellent facilities, and securing the safest and best equipment possible.

9. There should be continued research concerning the safety factor in football

TABLE V
Direct Fatalities 1992: Type of Activity Engaged In

TYPE OF ACTIVITY	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Tackling	0	0	1	0	1
TOTALS	0	0	1	0	1

TABLE VI
Direct Fatalities 1992: Cause Of Death

CAUSES	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Head Injury	0	0	1	0	1
TOTALS	0	0	1	0	1

TABLE VII
Direct Fatalities 1992: Position Played

POSITION	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Linebacker	0	0	1	0	1
TOTALS	0	0	1	0	1

TABLE VIII
Indirect Fatalities 1992: Cause of Death

CAUSES	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Heart Related	0	0	5	1	6
Aneurysm	0	0	1	0	1
Rare Bacterial Disease	0	0	1	0	1
Heat Stroke	0	0	1	0	1
Unknown	0	0	1	0	1
Seizure	1	0	0	0	1
TOTALS	1	0	9	1	11

TABLE IX
Head and Cervical Spine Fatalities

YEAR	HEAD FREQUENCY	HEAD PERCENT	CERVICAL SPINE FREQUENCY	CERVICAL SPINE PERCENT
1945-1954	87	20.1	32	28.8
1955-1964	115	26.6	23	20.7
1965-1974	162	37.4	42	37.9
1975-1984	69	15.9	14	12.6
TOTALS	433	100.0	111	100.0

(rules, facilities, equipment, and so forth).

10. Coaches should continue to teach and emphasize the proper fundamentals of blocking and tackling to help reduce head and neck fatalities. KEEP THE HEAD OUT OF FOOTBALL.

11. Strict enforcement of the rule of the game by both coaches and officials will help reduce serious injuries.

12. When a player has experienced or shown signs of head trauma (loss of consciousness, visual disturbances, headache, inability to walk correctly, obvious disorientation, memory loss), he should receive immediate medical attention and should not be allowed to return to practice or game without permission from the proper medical authorities.

Section IV
CASE STUDIES
DIRECT FATALITIES
High School

A 16 year old high school football player was injured in a junior varsity scrimmage game on August 21, 1992 and died on August 22, 1992. He was playing linebacker at the time and was struck in the chin being blocked while attempting to tackle the ballcarrier on a goal-line stand. Autopsy reports show cause of death as cerebral injuries (subdural hematoma).

Section V
CASE STUDIES
INDIRECT FATALITIES
High School

A 14 year old high school football player collapsed and later died on August 10, 1992 after conditioning drills with no pads. Cause of death was believed to be heart related. He had a physical exam before the season.

A 15 year old high school football player collapsed after practice on August 19, 1992 and later died in the hospital. He was a junior varsity player. The autopsy report shows cause of death as chronic myocarditis (inflammation of the muscular walls of the heart).

A 13 year old middle school football player collapsed during warm-up before a practice on October 6, 1992 and later died in the hospital. Cause of death was believed to be heart related.

A 14 year old football player collapsed during a game on October 9, 1992 and died later in the hospital. He was a junior varsity player and had a physical exam before the season. Cause of death was cardiac arrest.

A 17 year old high school football player collapsed during the first quarter of a game on September 11, 1992 and

died later. He had a physical exam before the season. The autopsy showed cause of death as hypertrophic cardiomyopathy.

A 17 year old high school football player was injured in a game on October 3, 1992 and died on October 11, 1992. The cause of death was not believed to be directly related to football and an autopsy was not performed.

A 17 year old high school football player collapsed on August 18, 1992 and died of heat stroke on August 20, 1992. The team was involved in running drills and the temperature was over 100 degrees.

A 14 year old high school football player suffered a cerebral aneurysm during practice on August 28, 1992 and he died on August 29, 1992.

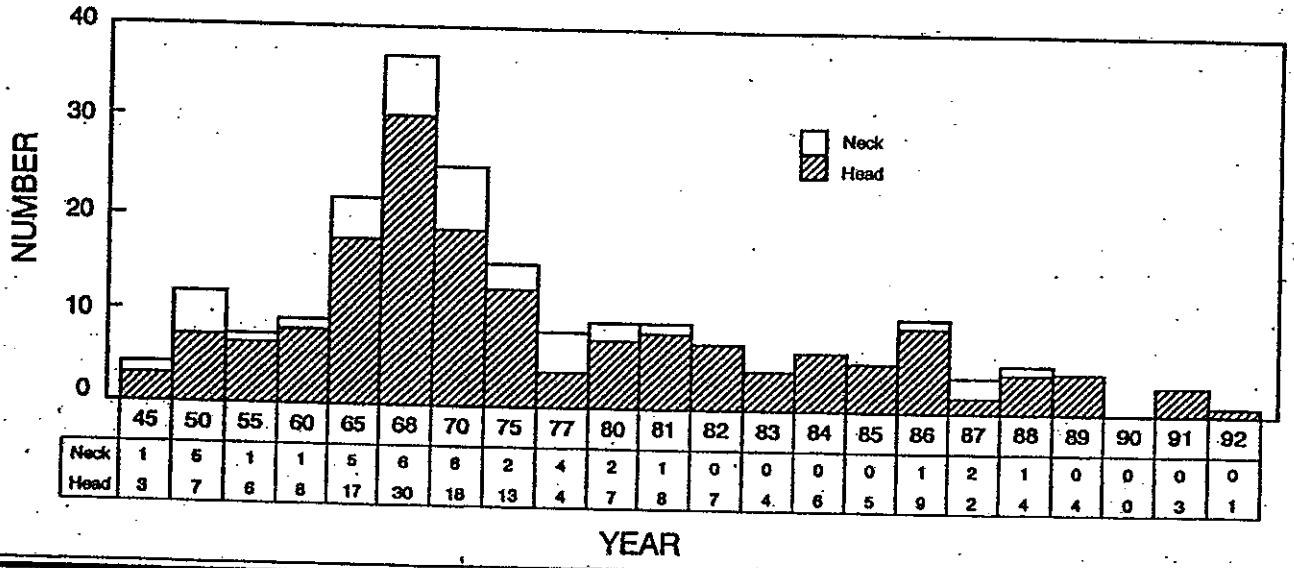
A 17 year old high school football player received a thigh bruise on September 11, 1992 during a game. He later had his leg amputated and died on September 26, 1992. Cause of death was a rare bacterial disease — beta hemolytic streptococcus — which caused a rapid muscle infection.

A 16 year old football player collapsed and died from cardiac arrest in a football camp on June 23, 1992. Autopsy results show the cause of death as hypertrophic cardiomyopathy.

College

A 20 year old college football player collapsed on the first day of spring conditioning program — January 16, 1992. He died on January 18, 1992. He had a physical exam just hours before he collapsed. Cause of death heart related.

FOOTBALL FATALITIES
HEAD AND NECK INJURIES



	45	50	55	60	65	68	70	75	77	80	81	82	83	84	85	86	87	88	89	90	91	92
Neck	1	5	1	1	5	6	6	2	4	2	1	0	0	0	0	1	2	1	0	0	0	0
Head	3	7	6	8	17	30	18	13	4	7	8	7	4	6	5	9	2	4	4	0	3	1

Adopt 'Safety First' Coaching Techniques

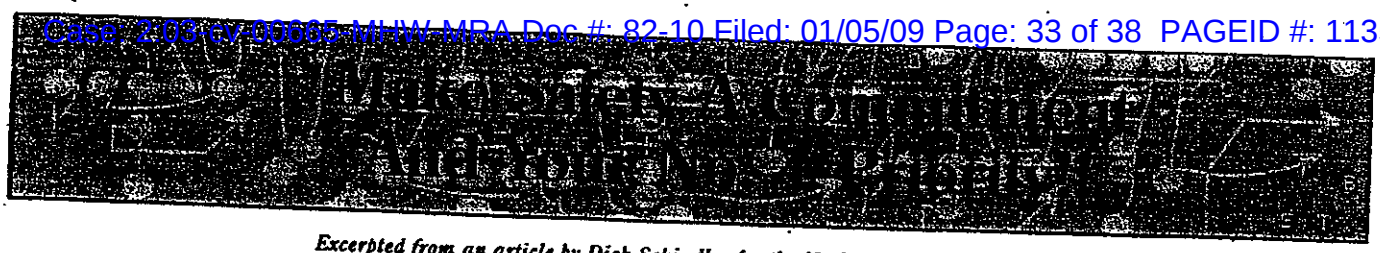
According to legal experts, "failure to warn" usually is one of the primary accusations made against those in the coaching profession in litigation which involves catastrophic injury to a player.

To help prevent what could result in the destruction of a coaching career, as well as massive financial loss, adopt 'safety first' coaching techniques:

1) Have a clear and complete understanding of the intent of correct application of safety rules.

2) Make graphically clear to players the risk of violating these rules and use the available 'printed' material as a constant authoritative reminder to them of the importance of correct techniques.

3) Point out in exact terms the risk of an 'accidental' catastrophic injury in athletics before the first practice begins.



Excerpted from an article by Dick Schindler for the National Federation News.

Coaches' Checklist

1) Keep the head up.
2) Discuss risk of injury.
3) Keep the head out of contact.
4) Explain how serious injuries occur.
5) Involve parents in early season meeting.
6) Have a set plan for coaching safety.
7) Clearly explain and demonstrate safe techniques.
8) Provide best medical care possible.
9) Monitor blocking and tackling techniques every day.
10) Repeat drills which stress proper and safe techniques.
11) Admonish and/or discipline users of unsafe techniques.
12) Receive clearance by doctor for athlete to play following head trauma.
13) Stress safety every day.
14) Don't glorify "head hunters".
15) Support officials who penalize illegal helmet contact.
16) Don't praise or condone illegal helmet contact.
17) Provide conditioning to strengthen neck muscles.
18) Entire staff must be "tuned in" to safety program.
19) Check helmet condition regularly.
20) Improper technique causes spinal-cord injuries.
21) Helmet must fit properly.
22) Be prepared for a catastrophic injury.
23) The game doesn't need abusive contact.
24) Player safety is your responsibility.
25) It's a game — not a job — for the players.

Keep The Head Out Of Football

A 1976 rule change that eliminated the head as the initial contact point in blocking and tackling has significantly reduced head and neck injuries in the sport over the last decade.

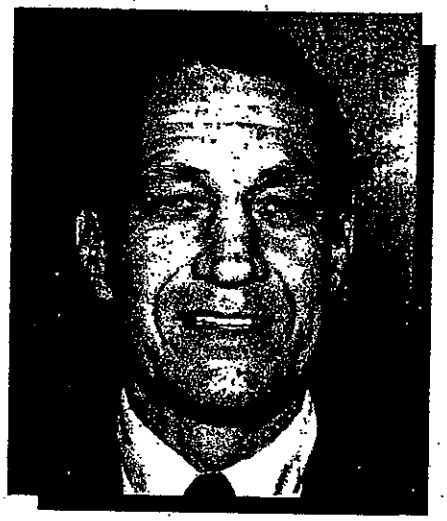
Coaches can do their part to continue that trend by teaching correct techniques and emphasizing proper fundamentals at all times. That way, players can avoid catastrophic injury and coaches can avoid lawsuits.

Keep the head out of football.

Frederick O. Mueller, Ph.D.
Chairman, American Football Coaches Committee on Football Injuries
and
Richard D. Schindler
Assistant Director of the National Federation of State High School Associations

Prepared for:
American Football Coaches Association, Orlando, Florida; National Collegiate Athletic Association, Overland Park, Kansas; National Federation of State High School Associations, Kansas City, Missouri.

Submitted February 1994



Mueller

Schindler

Section I
INTRODUCTION

In 1931 the American Football Coaches Association initiated the First Annual Survey of Football Fatalities. The original survey committee was chaired by Marvin A. Stevens, M.D., of Yale University, who served from 1931-1942. Floyd R. Eastwood, Ph.D., Purdue University, succeeded Dr. Stevens in 1942 and served through 1964.

Carl S. Blyth, Ph.D., University of North Carolina at Chapel Hill, was appointed in 1965 and served through the 1979 football season. In January 1980, Frederick O. Mueller, Ph.D., University of North Carolina at Chapel Hill, was appointed by the American Football Coaches Association and the National Collegiate Athletic Association to continue this research under the new title, Annual Survey of Football Injury Research.

The primary purpose of the Annual Survey of Football Injury Research is to make the game of football a safer and, therefore, a more enjoyable sports activity. Because of these surveys, the game of football has realized many benefits in regard to rule changes, improvement of equipment, and improved coaching techniques. The 1976 rule change that made it illegal to make initial contact with the head while blocking and tackling was the direct result of this research.

The 1990 report was historic in that it was the first year since the beginning of the research, 1931, that there was not a direct fatality in football at any level of play. This clearly illustrates that data collection and analysis is important and plays a major role in injury prevention.

Data Collection

Throughout the year, upon notification of a suspected football fatality, immediate contact is made with the appropriate officials (coaches, administrators, physicians, trainers). Pertinent information is collected through questionnaires and personal contact.

Football fatalities are classified for this report as direct and indirect. The criteria used to classify football fatalities are as follows:

Direct - Those fatalities which resulted directly from participation in the fundamental skills of football.

Indirect - Those fatalities which are caused by systemic failure as a result of exertion while participating in football activity or by a complication which was secondary to a non-fatal injury.

In several instances of reported football fatalities, the respondent stated the fatality should not be attributed to football. Reasons for these statements are that the fatality was attributed to physical defects that were unrelated to football injuries.

Participation numbers were updated in the 1989 report. The National Federation of State High School Associations has estimated that there are approximately 1,500,000 high school, junior high school, and non-federation school football participants in the United States. The college figure of 75,000 participants includes the National Collegiate Athletic Association, the National Association of Intercollegiate Athletics, the National Junior College Athletic Association, and an estimate of schools not associated with any national organization. Sandlot and professional football have been estimated at 225,000 participants. These figures give an estimate of 1,800,000 total football participants in the United States for the 1993 football season.

Dr. Mueller compiled and prepared the survey report on college, professional, and sandlot levels, and Mr. Richard D. Schindler of the National Federation of State High School Association assumed responsibility for collecting and preparing the senior and junior high school phase of the study. Sandlot is defined as non-school football, but organized and using full protective equipment.

At the conclusion of the football season, both reports are compiled into the Annual Survey of Football Injury Research. This report is sponsored by the American Football Coaches Association, the National Collegiate Athletic Association, and the National Federation of State High School Associations.

EXHIBIT 8

Acknowledgements

Medical data for the 1993 report was compiled by Dr. Robert C. Cantu, Chairman, Department of Surgery and Chief, Neurosurgery Service, Emerson Hospital, in Concord, MA. Dr. Cantu is is the Past-President of the American College of Sports Medicine and is the Medical Director for the National Center for Catastrophic Sports Injury Research at the University of North Carolina at Chapel Hill.

Section II

SUMMARY

1. There were four fatalities directly related to football during the 1993 football season. Three were associated with high school football and one with college football. (Table I)

2. The rate of direct fatal injuries is very low on a 100,000 player exposure basis. For the approximately 1,800,000 participants in 1993, the rate of direct fatalities was 0.22 participants per 100,000 players.

3. The rate of direct fatalities in high school and junior high school football was 0.20 participants per 100,000 players. The rate of direct fatalities in college was 1.33 participants per 100,000 players. (Table III)

4. Most direct fatalities usually occur during regularly scheduled games. In 1993, two of the direct fatalities occurred in games and two in practice.

5. The 1993 survey shows that one direct fatality occurred in August, two in September and one in October.

6. The major activities in football would naturally account for the greatest number of fatalities. In 1993 two of the direct fatalities happened while tackling, one while being tackled, and the activity of one was unknown. (Table V)

7. In 1993 three of the direct fatalities resulted from injuries to the head and one from a neck injury. (Table VI)

8. In many cases football cannot be directly responsible for fatal injuries (heat stroke, heart related and so forth). In 1993 there were nine indirect fatalities. Eight were associated with high school football, one was associated with college football. Seven of the high school indirect deaths were heart related and one was associated with an asthma attack. The college indirect fatality was heart related. (Table VII)

Section III

Discussion and Recommendations

After a slight rise in the number of football fatalities during the 1986 season, the 1990 data revealed the elimination of direct football fatalities. That was the first time in the past 59 years that there have been no direct football fatalities. There were three fatalities in 1991, two in 1992, and the 1993 data shows four direct fatalities - three at the high school level and one at the college level. The 1990, 1991, 1992 and 1993 data illustrate the importance of data collection and the analysis of this data in making changes in the game of football that help reduce the incidence of serious injuries. An all out effort must be made to keep these figures low and to strive for the elimination of football fatalities.

Head and Neck Injuries

Past efforts that were successful in reducing fatalities to the level indicated in the 1979, 1983, 1987, 1989, 1991, 1992 and 1993 data and the elimination of direct fatalities in 1990 should again be emphasized. Rule changes for the 1976 football season which eliminated the head as a primary and initial contact area for blocking and tackling is of utmost importance. Since 1960 most of the direct fatalities have been caused by head and neck injuries. We must continue to reduce head and neck injuries.

Several suggestions for reducing head and neck injuries are as follows:

1. Athletes must be given proper conditioning exercises which will strengthen their necks so that participants will be able to hold their heads firmly erect when making contact.

2. Coaches should drill the athletes in the proper execution of the fundamental football skills, particularly blocking and tackling. **Contact should always be made with the head up and never with the top of the head/helmet. Initial contact should never be made with the head/helmet or face mask.**

3. Coaches and officials should discourage the players from using their

TABLE I

Fatalities: Directly Due To Football - 1931 - 1993*

Year	SANDLOT Direct	PRO AND SEMIPRO Direct	HIGH SCHOOL Direct	COLLEGE Direct	TOTAL Direct
**1931-1959	115	68	262	41	486
1960	1	1	11	1	14
1961	3	0	10	6	19
1962	6	1	12	0	19
1963	1	1	12	2	16
1964	4	1	21	3	29
1965	4	0	20	1	25
1966	4	0	20	0	24
1967	5	0	16	3	24
1968	4	1	26	5	36
1969	3	1	18	1	23
1970	3	0	23	3	29
1971	2	0	15	3	20
1972	3	1	16	2	22
1973	2	0	7	0	9
1974	0	0	10	1	11
1975	1	0	13	1	15
1976	3	0	15	0	18
1977	1	0	8	1	10
1978	0	0	9	0	9
1979	0	0	3	1	4
1980	0	0	9	0	9
1981	2	0	5	2	9
1982	2	0	7	0	9
1983	0	0	4	0	4
1984	1	0	4	1	6
1985	2	0	4	1	7
1986	0	0	11	1	12
1987	0	0	4	0	4
1988	0	0	7	0	7
1989	0	0	4	0	4
1990	0	0	0	0	0
1991	0	0	3	0	3
1992	0	0	1	0	1
1993	0	0	3	1	4
TOTALS	172	75	614	81	942

* No study was made in 1942.
** Yearly totals available from past reports.

heads as battering rams when blocking and tackling. The rules prohibiting spearing should be enforced in practice and in games. The players should be taught to respect the helmet as a protective device and that the helmet should not be used as a weapon.

4. All coaches, physicians, and trainers should take special care to see that the player's equipment is properly fitted, particularly the helmet.

5. When a player has experienced or shown signs of head trauma (loss of consciousness, visual disturbances, headache, inability to walk correctly, obvious disorientation, memory loss), he should receive immediate medical attention and should not be allowed to return to practice or game without permission from the proper medical authorities.

Another important effort has been and continues to be the improvement of football protective equipment. It is imperative that old and worn equipment be properly renovated or discarded and continued emphasis be placed on developing the best equipment possible. Manufacturers, coaches, trainers, and physicians should continue their joint and individual efforts toward this end.

The authors of this research are convinced that the current rules which eliminate the head in blocking and tackling, coaches teaching the proper fundamentals of blocking and tackling, the helmet research conducted by NOCSAE, excellent physical conditioning and proper medical supervision and a good data collection system have played the primary role in reducing fatalities and serious head and neck injuries in football.

This is best illustrated by Table IX and Graph I which shows the increase in both head and cervical spine fatalities during the decade from 1965-1974. This time period was associated with blocking and tackling techniques that involved the head as the initial point of contact. The reduction in head and cervical spine injuries is down in the decade from 1975-1984. This decade was associated with the 1976 rule change that eliminated the head as the initial contact point in blocking and tackling. There is no doubt that the 1976 rule change has made a difference and that a continued effort should be made to keep the head out of the fundamental skills of football. Data from the decade 1985 - 1994 will be available in the Annual Survey of Football Injury Research 1931 - 1994.

Heat Stroke

A continuous effort should be made to eliminate heat stroke deaths associated with football. Since the beginning of the survey through 1959 there were five cases of heat stroke death reported. From 1960 through 1993 there have been eighty heat stroke cases which resulted in death (Table IV).

Since 1974 there has been a dramatic reduction in heat stroke deaths with the exception of 1978 when there were four. There were no heat stroke deaths in 1993. All coaches, trainers, and physicians should continue their efforts toward eliminating athletic fatalities which result from physical activities in hot weather.

Heat stroke and heat exhaustion are prevented by careful control of various factors in the conditioning program of the athlete. When football activity is carried on in hot weather, the following suggestions and precautions should be taken:

1. Each athlete should have a complete physical examination with medical history and an annual health history update. History of previous heat illness and type of training activities before organized practice begins should be included.

2. Acclimatize athletes to heat gradually by providing graduated practice sessions for the first seven to ten days and other abnormally hot or humid days.

3. Know both the temperature and the humidity since it is more difficult for the body to cool itself in high humidity. Use of a sling psychrometer is recommended to measure the relative humidity and anytime the wet-bulb temperature is over 78 degrees practice should be altered.

4. Adjust activity level and provide frequent rest periods. Rest in cool shaded areas with some air movement and remove helmets and loosen or remove jerseys. Rest periods of 15-30 minutes should be provided during

TABLE II

Fatalities: Indirectly Due To Football - 1931 - 1993*

Year	SANDLOT Indirect	PRO AND SEMIPRO Indirect	HIGH SCHOOL Indirect	COLLEGE Indirect	TOTAL Indirect
**1931-1959	72	12	112	28	224
1960	0	0	2	2	4
1961	4	1	11	0	16
1962	0	1	4	2	7
1963	2	0	4	2	8
1964	3	0	12	1	16
1965	4	1	14	5	24
1966	0	0	6	2	8
1967	0	0	4	1	5
1968	2	0	8	2	12
1969	3	1	8	3	15
1970	0	0	12	2	14
1971	2	1	7	2	12
1972	0	0	10	1	11
1973	0	0	5	3	8
1974	0	0	5	3	8
1975	2	0	3	3	8
1976	1	0	7	2	10
1977	0	0	6	0	6
1978	0	0	8	1	9
1979	1	0	8	1	10
1980	0	0	4	0	4
1981	0	0	6	0	6
1982	1	0	7	3	11
1983	0	0	6	3	9
1984	0	0	3	0	3
1985	0	0	1	1	2
1986	0	0	6	1	7
1987	0	0	4	3	7
1988	1	0	10	0	11
1989	0	0	9	2	11
1990	0	0	3	3	6
1991	0	0	3	1	4
1992	1	0	9	1	11
1993	0	0	8	1	9
TOTALS	99	17	335	85	536

* No study was made in 1942.
** Yearly totals available from past reports.

workouts of one hour.

5. Provide adequate cold water replacement during practice. Water should always be available and in unlimited quantities to the athletes. GIVE WATER REGULARLY.

6. Salt should be replaced daily and liberal salting of the athletes' food will accomplish this purpose. Coaches should not provide salt tablets to athletes. Attention must be directed to water replacement.

7. Athletes should weigh in each day before and after practice and weight charts checked in order to treat the athlete who loses excessive weight each day. Generally, a three percent body weight loss through sweating is safe, and a five percent loss is in the danger zone.

8. Clothing is important and a player should avoid use of long sleeves, long stockings, and any excess clothing.

TABLE III

Direct Fatalities Incidence Per 100,000 1931 - 1993*

YEAR	HIGH SCHOOL	COLLEGE
**1931-1959		
1960	1.78	1.53
1961	1.62	9.23
1962	1.94	0.00
1963	1.94	3.04
1964	2.23	4.56
1965	2.00	1.33
1966	2.00	0.00
1967	1.60	4.00
1968	2.60	6.60
1969	1.64	1.33
1970	1.92	4.00
1971	1.25	4.00
1972	1.33	2.67
1973	0.58	0.00
1974	0.83	1.33
1975	1.08	1.33
1976	1.00	0.00
1977	0.53	1.33
1978	0.60	0.00
1979	0.23	1.33
1980	0.69	0.00
1981	0.38	2.67
1982	0.54	0.00
1983	0.30	0.00
1984	0.30	1.33
1985	0.30	1.33
1986	0.84	1.33
1987	0.30	0.00
1988	0.46	0.00
1989	0.27	0.00
1990	0.00	0.00
1991	0.20	0.00
1992	0.14	0.00
1993	0.20	1.33

* No study was made in 1942.
** Yearly totals available from past reports.

Based on 1,500,000 junior and senior high school players and 75,000 college players.

Never use rubberized clothing or sweatsuits.

9. Some athletes are more susceptible to heat injury. These individuals are not accustomed to work in the heat, may be overweight, and may be the eager athlete who constantly competes at his capacity. Athletes with previous heat problems should be watched closely.

10. It is important to observe for signs of heat illness. Some trouble signs are nausea, incoherence, fatigue, weakness, vomiting, cramps, weak rapid pulse, flushed appearance, visual disturbance, and unsteadiness. If heat illness is suspected, seek a physician's immediate service. Recommended emergency procedures are vital.

11. An increasing number of medical personnel are now using a new treatment for heat illness that involves applying either alcohol or cool water to the victim's skin and is followed by vigorous fanning. The fanning causes evaporation and cooling. (Source: The First Alder-September 1987).

Recommendations

Specific recommendations resulting from the 1993 survey data are as follows:

1 Mandatory medical examinations and medical history should be taken before allowing an athlete to participate in football. The NCAA recommends a thorough medical examination when the athlete first enters the college athletic program and an annual health history update with the use of referral exams when warranted. If the physician or coach has any questions about the athlete's readiness to participate, the athlete should not be allowed to play. High school coaches should follow the recommendations set by their state high school athletic associations.

2. All personnel concerned with training football athletes should emphasize proper, gradual, and complete physical conditioning. Particular emphasis should be placed on neck strengthening exercises.

3. A physician should be present at all games and practice sessions. If it is impossible for a physician to be present at all practice sessions, emergency measures must be provided.

4 All personnel associated with football participation should be cognizant of the problems and safety measures related to physical activity in hot weather.

5. Each institution should strive to have a team trainer who is a regular member of the faculty and is adequately prepared and qualified.

6. Cooperative liaison should be maintained by all groups interested in the field of Athletic Medicine (coaches, trainers, physicians, manufacturers, administrators, and so forth).

7. There should be strict enforcement of game rules, and administrative regulations should be enforced to protect the health of the athlete. Coaches and school officials must support the game officials in their conduct of the athletic contests.

8. There should be a renewed emphasis on employing well-trained athletic personnel, providing excellent facilities, and securing the safest and best equipment possible.

9 There should be continued research concerning the safety factor in football (rules, facilities, equipment, and so forth).

10. Coaches should continue to teach and emphasize the proper funda-

TABLE IV

Heat Stroke Fatalities 1931 - 1993*

YEAR	TOTAL
1931-1954	0
1955	1
1956-1958	0
1959	4
1960	3
1961	3
1962	5
1963	0
1964	4
1965	6
1966	1
1967	2
1968	5
1969	5
1970	8
1971	4
1972	7
1973	3
1974	1
1975	0
1976	1
1977	1
1978	4
1979	2
1980	1
1981	2
1982	2
1983	1
1984	3
1985	0
1986	0
1987	1
1988	2
1989	1
1990	1
1991	0
1992	1
1993	0
TOTALS	85

* No study was made in 1942.

TABLE V

Direct Fatalities 1993: Type of Activity Engaged In

TYPE OF ACTIVITY	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Tackling	0	0	2	1	3
Tackled	0	0	1	0	1
TOTALS	0	0	3	1	4

TABLE VI

Direct Fatalities 1993: Cause Of Death

CAUSES	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Head Injury	0	0	2	1	3
Neck Injury	0	0	1	0	1
TOTALS	0	0	3	1	4

TABLE VII

Direct Fatalities 1993: Position Played

POSITION	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Linebacker	0	0	1	0	1
Quarterback	0	0	1	0	1
Defensive Back	0	0	1	0	1
Tackling Drill	0	0	0	1	1
TOTALS	0	0	3	1	4

TABLE VIII

Indirect Fatalities 1993: Cause of Death

CAUSES	SANDLOT	PRO	HIGH SCHOOL	COLLEGE	TOTAL
Heart Related	0	0	7	1	8
Asthma	0	0	1	0	1
TOTALS	0	0	8	1	9

TABLE IX

Head and Cervical Spine Fatalities

YEAR	HEAD FREQUENCY	HEAD PERCENT	CERVICAL SPINE FREQUENCY	CERVICAL SPINE PERCENT
1945-1954	87	20.1	32	28.8
1955-1964	115	26.6	23	20.7
1965-1974	162	37.4	42	37.9
1975-1984	69	15.9	14	12.6
TOTALS	433	100.0	111	100.0

mentals of blocking and tackling to help reduce head and neck fatalities. KEEP THE HEAD OUT OF FOOTBALL.

11. Strict enforcement of the rule of the game by both coaches and officials will help reduce serious injuries.

12. When a player has experienced or shown signs of head trauma (loss of consciousness, visual disturbances, headache, inability to walk correctly, obvious disorientation, memory loss), he should receive immediate medical attention and should not be allowed to return to practice or game without permission from the proper medical authorities.

Section IV
CASE STUDIES
DIRECT FATALITIES

High School

A 15 year old high school football player was injured in a game on September 8, 1993 and died on September 20, 1993. He was attempting to make a tackle in a practice drill and suffered a fracture-dislocation of a cervical vertebra. No other information was available.

A 17 year old high school football player was injured on September 24, 1993, and died on September 30, 1993. The athlete was injured in a game but the exact activity at the time of the injury was unknown. The Medical Examiner stated that the injury was directly related to contact. He played both tight end and linebacker in the game and collapsed during the third quarter. Cause of death was a subdural hematoma.

A 16 year old high school football player was injured on October 21, 1993, and died on October 29, 1993. The athlete was playing quarterback in a game. In the fourth quarter he was rolling out to pass and following release of the ball was hit by a defender. Cause of death was cerebral trauma.

College

A 19 year old, college freshman football player was injured in a practice session on August 26, 1993 and died August 27, 1993. he collapsed on the field after tackling in a practice drill. Cause of death was a subdural hematoma.

Section V
CASE STUDIES
INDIRECT FATALITIES

High School

A 15 year old high school football player had an asthma attack 15 minutes after practice and died on August 27, 1993. He passed the physical exam to participate in football.